Vol. 895 Number 2

OFFICIAL GAZETTE

of the

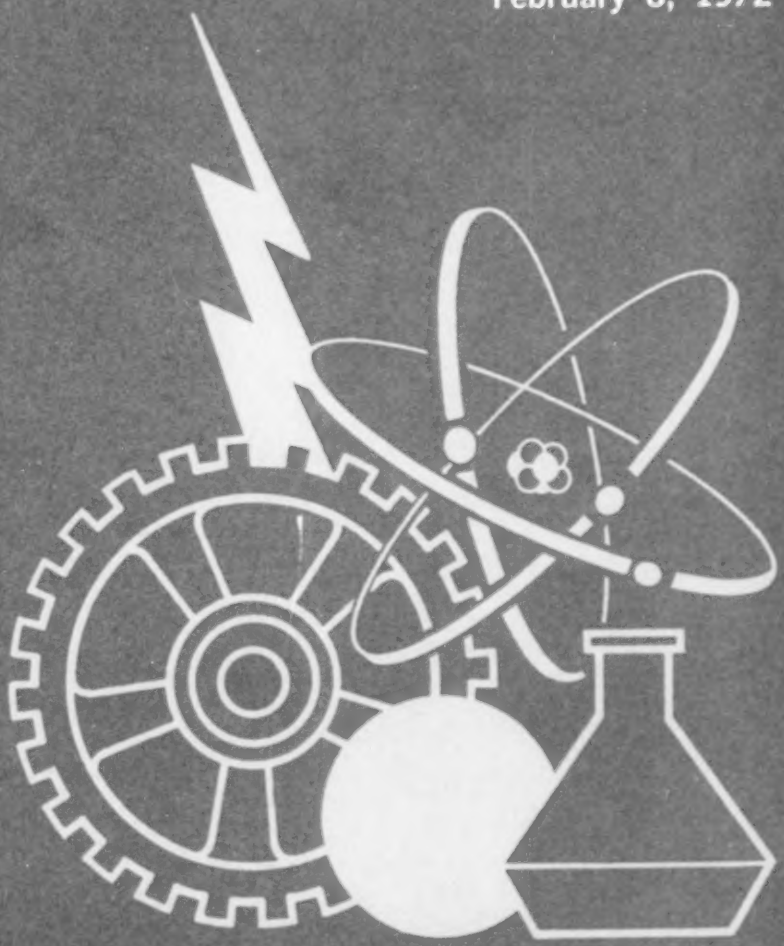
UNITED STATES PATENT OFFICE

SER BB

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

February 8, 1972



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U. S. DEPARTMENT OF COMMERCE

Patent Office

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

February 8, 1972 Volume 895 Number 2

CONTENTS

	Page
Issue of February 8, 1972	389
Patents and Trademark Notices	
Registration to Practice	390
Identification of Goods and Services in Trademark Applications—(Reprint of Notice and Amendment)	390
Patent Suits	390
Patent Notices	
Certificates of Correction for the Week of Feb. 8, 1972	393
Condition of Patent Applications	394
Patent Granted	
General and Mechanical	395
Chemical	589
Electrical	682
Design Patents Granted	771
Index of Patentees	PI 1
Index of Designs	PI 51
Classification of	
Patents	PI 53
Designs	PI 56
Geographical Index of Residence of Inventors	
Patents	PI 57
Designs	PI 59

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $89.00 per annum, foreign mailing $22.25 additional; single copies $2.00 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $17.00 per annum, foreign mailing $4.25 additional; single copies 40 cents each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS or TRADEMARKS, price 15 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent Office either on the basis of 4 years or more service in the Examining Corps or under Rule 341(e) of the "Rules of Practice of the United States Patent Office in Patent Cases."

Information tending to affect the eligibility of said applicants on moral, or ethical, or other grounds should be furnished the Commissioner of Patents on or before February 29, 1972.

Dua, Robert A., 13512 Sherwood Forest Terr., Silver Spring, Md., 20904

Hodson, Gordon W., 1411 Strathy Ave., Mississauga, Ontario, Canada

Legarda, Aurora A., 148 Summit Ave., Apt. 10, Jersey City, N.J., 07304

Major, Theodore, 4913 Andrea Ave., Annandale, Va., 22003

Sher, Melvin, Canadian Marconi Co., 2442 Trenton Ave., Montreal 301, Quebec, Canada

LUTRELLE F. PARKER,
Jan. 13, 1972. *Chairman, Committee on Enrollment.*

Identification of Goods and Services in Trademark Applications—(Reprint of Notice and Amendment)

Effective immediately, the Alphabetical List of Goods and Services which appears in the volume entitled "International Classification of Goods and Services to Which Trade Marks Are Applied" (published by the World Intellectual Property Organization (WIPO)) is adopted as a general guideline for determining the degree of particularity of identification of goods and services required in trademark applications.

Terms which appear in the International Classification listing will generally be accepted as proper identifications of goods and services. The use in the listing of more specific identifications indented below the heading term does not necessarily preclude acceptability of that heading. For example, the International Classification lists, as Item A407, *Ammunition*, followed by specific types of ammunition, as Items A408 and A409 and A410. "Ammunition" will be accepted as an identification in accordance with *In re Dynamit Nobel AG*, 169 USPQ 499 (TTAB, 1971). However, if the more specific term is used whenever appropriate, prosecution of the application may be shortened since the possibility of a requirement of greater particularity (see below) is reduced.

Greater particularity than is set forth by the terms in the International Classification listing may not be required by the Examiner in the absence of a clear need therefor. Typical illustrations of clear need can be found in the following situations:

(1) The broad term includes items which are classified in more than one class. (For example, "artists' materials.")

(2) The broad term is too indefinite for proper examination. (For example, "metallic parts.")

(3)(a) The identification is inconsistent with the goods or services disclosed by the specimens.

(b) The ordinary meaning of the identification is at variance with the goods or services disclosed by the specimens or the record. (For example, "decalcomanias" are not adequately identified by the term "publications." See also *Ex parte Consulting Publishing Co.*, 115 USPQ 240.)

(4) Wording included in the mark requires limitation of the identification. (For example, "beer" may not be included in the identification where the mark is "Newark 'Olde Town' Ale" (*Ex parte Consumers Brewing Co.*, 55 USPQ 426).)

On the other hand, some situations do *not* constitute clear need, as illustrated by the following:

(1) The existence of a decision holding that a likelihood of confusion exists in relation to items which are narrowly identified does not in itself constitute a clear need to require amendment of a broad identification to the more specific items mentioned in the decision.

(2) If the identification is understood when read in association with the title of the class in which it is placed and is otherwise satisfactory, further qualifying amendment should not be required. (For example, "mufflers" in the clothing class would not require further modification to indicate that articles of clothing are intended; similarly the term "house organ" in the class for printed publications would not need further qualification.)

In a few instances, the terminology in the International Classification of Goods and Services is not in common usage in the United States. Where this occurs, the term more commonly used in this country should be selected.

The English edition of the "International Classification of Goods and Services to Which Trade Marks Are Applied" can be ordered from:

Sales Branch, The Patent Office
Block C, Station Square House
St. Mary Cray, Orpington, Kent, England

Certain modifications and additions to the Classification have been published as supplements and are also available from the British Office.

We have been advised by the British Patent Office that the only acceptable methods of payment are by International Money Order or banker's draft, payable in sterling and drawn on a bank in the United Kingdom. Orders for the International Classification and for the supplements can be made by remittance in the following amount(s):

International Classification	50 pence
Nov. 15, 1967, supplement	5 pence
Mar. 18, 1970, supplement	Free
Mar. 3, 1971, supplement	10 pence
Total cost (including postage by surface mail)	65 pence
Additional charge for postage by air mail	1 pound 55 pence
Total cost by airmail	2 pounds 20 pence

Orders should be sent directly to:

Sales Branch, The Patent Office, Block C.
Station Square House, St. Mary Cray,
Orpington, Kent, England

RENE D. TEGTMEYER,
Assistant Commissioner for Appeals, Legislation and Trademarks.

Date: Jan. 13, 1972.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,774,931, Kinkaid and Hammell, TERMINAL CLIP, **filed** May 18, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1210, *AMP Inc.* v. *Ramez Mfg. Co.* By consent order defendant enjoined, Oct. 12, 1971.

2,867,001, Lewis, Rice and Estrin, MEANS AND METHOD FOR FORMING INDICIA ON THE SURFACE OF CONTINUOUS VULCANIZED PRODUCTS, **filed** May 24, 1971, U.S. Ct. of Appeals, First Circuit, Mass. (Boston), Doc. 71–1164, *Teledyne Mid-America Corporation* v. *International Telephone & Telegraph Corporation*. The judgment of the district court in so far as it holds the patent in suit to be invalid is affirmed, Oct. 7, 1971.

2,881,476, Mark Page, HOLLOW OBJECT MOLDING APPARATUS WITH MOVING HEATERS, **filed** Oct. 31, 1967, D.C., E.D.N.Y. (Brooklyn), Doc. 67–C–1024, *Mark Page* v. *County Plastics Corp. et al.* Dismissed, Nov. 3, 1971.

2,909,134, J. A. Kniefel, MACHINE FOR LAYING FLEXIBLE PIPE WITH ATTACHED RISERS, **filed** Mar. 22, 1971, D.C., E.D. Calif. (Fresno), Doc. F–504–C, *Joseph A. Kniefel* v. *Agwater, Inc.* Consent judgment, plaintiff is valid owner of patent and defendant has infringed, Nov. 12, 1971.

2,909,816, Robert J. Wood, POST SUPPORT, **filed** Nov. 1, 1971, D.C., N.D. Calif. (San Francisco), Doc. C–71–2100 LHB, *Woodmark Products, Inc.* v. *Simpson Mfg. Co.*

2,932,397, John F. Ogden, CONDUIT SYSTEM FOR SWIMMING POOLS, **filed** May 15, 1971, D.C., N.D. Ala. (Birmingham), Doc. 70–352–S, *Paddock of California, Inc.* v. *National Filtronics, Inc.* Judgment enjoining defendant from infringing on patent, patent valid, Sept. 30, 1971.

2,959,555, Martin and Abel, COPPER AND IRON CONTAINING SCALE REMOVAL FROM FERROUS METAL, **filed** Sept. 28, 1971, D.C., N.D. Okla. (Tulsa), Doc. 71–C–346, *Halliburton Company* v. *Dow Chemical Company.*

3,021,871, Frank J. Rodgers, HOSE FOR PORTABLE PNEUMATIC EQUIPMENT, **filed** Nov. 25, 1970, D.C., E.D. Wis. (Milwaukee), Doc. 70–C–663, *Samuel Moore & Company* v. *Imperial-Eastman Corporation.* Order dismissing plaintiff's claim and defendant's counterclaim, with prejudice, etc., Aug. 6, 1971.

3,039,773, Teeguarden and Teeguarden, BALLS, **filed** Nov. 8, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2659–ALS, *Harry W. Teeguarden and Lillian Teeguarden* v. *A. G. Spalding & Bros., Inc.*

3,083,349, Isaac S. Blonder, TRANSMISSION-LINE CLAMP-AND-CONNECTOR, **filed** Oct. 12, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2459–HP, *Blonder-Tongue Electronics* v. *Macon Industries.*

3,104,799, Donald J. Steidinger, ENVELOPE ASSEMBLY, **filed** Sept. 1, 1967, D.C., N.D. Ill. (Chicago), Doc. 67c1522, *UARCO Incorporated* v. *Moore Business Forms, Inc.* Order certain claims declared invalid, defendant awarded attorney's fees and costs, cause hereby dismissed, Nov. 19, 1969, Notice of Appeal by plaintiff filed Dec. 17, 1969, from U.S.C.A. Final judgment, it is ordered and adjudged by this court that the judgment of the said district court finding the No. 3,104,799, Steidinger patent invalid be, and the same is hereby reversed, the judgment making an allowance for attorney fees to defendant, be and the same is hereby reversed and cause be, and it is hereby remanded to the said district court for full consideration of the issue as to alleged infringement, in accordance with the opinion of this court filed this day, Nov. 2, 1971.

3,104,924, Frederick E. Capel, LAMP CONNECTOR, **filed** Oct. 28, 1970, D.C., S.D.N.Y., Doc. 70–C–4748, *Ward Foods, Inc.* v. *Spartans Industries, Inc.* Consent-stipulation that this action is dismissed under Rule 41(a)(1) FRCP without costs, Nov. 4, 1971.

3,140,035, Frederick A. Wenzel, SERVICE TRAY, **filed** Sept. 24, 1971, D.C. Mass. (Boston), Doc. 71–2052–F, *St. Regis Paper Company* v. *Winchester Carton Corporation.*

3,167,279, Brian R. A. Reffell, PARACHUTE, **filed** Oct. 5, 1971, U.S. Court of Claims, Washington, D.C., Doc. 755–71, *Walter Kidde & Company, Inc. and Walter Kidde Company Limited* v. *The United States of America.*

3,187,949, John J. Mangel, SPRAY DISPENSER FOR PRESSURIZED LIQUID HAVING TIMER CONTROL, **filed** Nov. 5, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2655 WPG, *John J. Mangel and C-H Products Corporation* v. *William G. Kempton et al.*

3,220,522, Thomas G. Carter, Jr., POSITIVE CLUTCH, **filed** Sept. 29, 1971, D.C., N.D. Tex. (Dallas), Doc. CA–3–3587C, *Thomas G. Carter, Jr.* v. *D & J Gear Company.* Thomas G. Carter, Jr. owner of patent which is valid. Defendant is perpetually enjoined, Sept. 29, 1971.

3,226,916, Bradford and Jenkins, MUD TREATING APPARATUS, **filed** Nov. 2, 1971, D.C., S.D. Tex. (Houston), Doc. 71–H–1220, *Well Control, Inc.* v. *11–7 Service, Inc. et al.*

3,229,880, Ewald A. Arp, STAMP DISPENSING MACHINE, **filed** June 30, 1969, D.C., N.D. Ill (Chicago), Doc. 69c1360, *Artag Plastics Corp.* v. *Patents Development Quorum.* Final judgment, complaint dismissed with prejudice, Oct. 8, 1971.

3,241,235, Martin S. Hanley, TICKET ASSEMBLY, **filed** Jan. 27, 1969, D.C., N.D. Ohio (Cleveland), Doc. C69–60, *Sherburne Corporation* v. *Ohio Spring Specialties, Inc.* Permanent injunction issued restraining defendant from infringing patent, Nov. 3, 1971.

3,249,270, Benjamin Zuckerman, GARMENT SUPPORT MEANS, **filed** Sept. 28, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71–C–1277, *Mr. Hanger, Inc.* v. *Plasti-Form Enterprises Corporation.*

3,266,173, Gene H. Sheridan, TRAINING APPARATUS, **filed** Sept. 24, 1971, D.C. Del. (Wilmington), Doc. 4231, *The Aetna Casualty and Surety Company* v. *Singer-General Precision, Inc.*

3,288,526, Klaus E. B. Krutzikowsky, COLLAPSIBLE TRAILER, **filed** Sept. 27, 1971, D.C., E.D. Wis. (Milwaukee), Doc. 71–C–488, *K. E. B. Krutzikowsky* v. *Trade Winds Co., Inc.*

3,302,647, Arthur E. Marsan, SEALING PAD FOR A POST-SURGICAL DRAINAGE POUCH, **filed** Sept. 3, 1971, D.C., M.D. Fla. (Tampa), Doc. 71–406–C, *Hollister Incorporated* v. *Howmet Corporation.*

3,304,371, Alex J. Rosenberg, INFORMATION PROCESSING SYSTEM, **filed** May 28, 1968, D.C., E.D.N.Y. (Brooklyn), Doc. 68–C–530, *Alex Jacob Rosenberg* v. *Standard Food Products Corp.* Order of dismissal, Oct. 1, 1971.

3,313,353, Leslie M. Pierce, APPARATUS FOR SUPPORTING AND CONTROLLING POWER FASTENER TOOLS AND THE LIKE, **filed** Oct. 24, 1969, D.C., N.D. Iowa (Cedar Rapids), Doc. 69–C–31–CR, *Clary Corporation* v. *Douglas, Inc. et al.*

3,315,345, James R. Bartsch, UNITARY MOLDED GOLF BALL, **filed** Oct. 8, 1971, D.C.R.I. (Providence), Doc. 4738, *PCR Golf Ball Company, Inc.* v. *Uniroyal, Inc.*

3,321,081, Allan H. Willinger, AQUARIUM FILTER APPARATUS, **filed** Nov. 10, 1971, D.C. Mass. (Boston), Doc. 71–2550–C, *Metaframe Corporation* v. *Pace Plastics Inc.*

3,326,692, Martino and Blaese, METHOD OF AND APPARATUS FOR COOKING, **filed** May 17, 1971, D.C., N.D. Ill. (Freeport), Doc. 71c24, *Restaurant Technology, Inc.* v. *Geropco Inc.* Consent judgment, patent valid and infringed. Permanent injunction, parties to bear own costs, Sept. 4, 1971.

3,334,561, Robert E. Watson, SHIELDED-HINGE TOILET SEAT CONSTRUCTION, **filed** Sept. 29, 1971, D.C., E.D. Wis. (Milwaukee), Doc. 71–C–495, *Swedish Crucible Steel Company* v. *Bemis Manufacturing Company.*

3,343,961, Harry Truax, METHOD FOR TREATING SOYBEANS AND THE LIKE USING INFRA-RED HEAT, **filed** Oct. 23, 1970, D.C., N.D. Iowa (Cedar Rapids), Doc. 70–C–30–CR, *Mix-Mill, Inc. and Harry Truax & Sons Company, Inc.* v. *Walter Johnson and Merritt Fisher, etc.* Dismissed by plaintiff without prejudice, Nov. 30, 1970.

3,355,625, William A. Ward, RECURRENT PULSING SYSTEM WITH SEMICONDUCTOR JUNCTION RECTIFIER IN CAPACITOR DISCHARGE PATH, **filed** Sept. 30, 1971, D.C. Mass. (Boston), Doc. CA 71–2068–W, *United States Scientific Instruments, Inc.* v. *EG & G Inc.*

3,368,932, Weill, Woods and Solomon, APPARATUS FOR LAMINATING TWO FABRICS TO FOAM IN ONE SINGLE OPERATION, **filed** Jan. 6, 1969, D.C., E.D.N.Y. (Brooklyn), Doc. 69C8, *Flame Laminating Machines Corporation* v. *Ideal Foam Corporation.* Order of dismissal, Nov. 9, 1971.

3,394,485, Clayton E. Conklin, METHOD FOR REINFORCING TEXTILE GARMENTS, **filed** Nov. 18, 1968, D.C., S.D.N.Y., Doc. 68–C–4540, *The B. F. Goodrich Company* v. *Mann Manufacturing, Inc.* Filed stipulation and order of dismissal as to complaint and counterclaim, each party to bear own costs, June 18, 1971.

3,401,269, Michael A. Tabet, COMPOSITE COVER FOR PHOTOELECTRIC CONTROL UNIT AND METHOD FOR MAKING SAME, **filed** Sept. 27, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c2339, *Michael A. Tabet* v. *City of Chicago.*

3,425,626, Dietz and Dietz, DRINKING STRAW, **filed** Feb. 24, 1969, D.C., E.D.N.Y. (Brooklyn), Doc. 69–C–197, *John F. Dietz et al.* v. *Newman Premier Corp.* Order of Dismissal, Nov. 8, 1971.

3,444,865, Guy F. DeVita, TRANSFORMATION WIG, **filed** Oct. 12, 1971, D.C., N.D. Ohio (Cleveland), Doc. 71–1012, *Carousel Fashions, Inc.* v. *The Higbee Company.*

3,452,964, Lionel Bibeault, PORTABLE LIFTING AND/OR SPRING WINDING DEVICE, **filed** Oct. 5, 1971, D.C.R.I. (Providence), Doc. 4734, *Paul Pimbel* v. *Lionel Bibeault.*

3,480,912, Speeth and Norem, SOUND LEVEL VISUAL INDICATOR HAVING CONTROL CIRCUITS FOR CONTROLLING PLURAL LAMPS, **filed** Sept. 27, 1971, D.C., N.D. Tex. (Dallas), Doc. CA–3–3146–D, *Autotelic Industries, Inc.* v. *Kinder Kollege Educational Systems, Inc. et al.*

3,485,694, Bauder, Hart and Cleminshaw, METHOD FOR USING HIGH FREQUENCY HEAT TO MAKE A SEAM IN A FILTER, **filed** May 12, 1970, D.C., S.D.N.Y., Doc. 70–C–1924, *Cambridge Filter Corp.* v. *ARCO Manufacturing Corp.* Final judgment on consent, defendant enjoined. Defendant's counterclaim for a declaratory judgment dismissed without prejudice, Sept. 20, 1971.

3,516,163, Charles A. Hisserich, MARKING MACHINE, **filed** Nov. 10, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2690–RJK, *E. E. Simmons* v. *Vard Newport.*

3,525,457, Hausmann and Hausmann, DEVICE FOR HOLDING AND EMPTYING TUBES, **filed** Sept. 15, 1971, D.C., S.D.N.Y., Doc. 71–C–4107, *Else Hausmann & Heinrich Hausmann* v. *Alfred E. Knobler & Company, Inc.*

3,565,083, Samuel J. Popell, METHOD FOR SETTING HAIR, **filed** June 4, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1352, *Popell Brothers, Inc.* v. *Aldens Inc.* **Same, filed** Apr. 23, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c978, *Popell Brothers, Inc.* v. *Associated Mills, Inc.* **Same, filed** Apr. 23, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c979, *Popell Brothers, Inc.* v. *Sunbeam Corporation et al.*

3,588,084, Edward H. Stempel, SHELVING, **filed** Oct. 1, 1971, D.C., S.D. Fla. (Miami), Doc. 71–1527–C–TC, *Belaco, Inc.* v. *Advance Metal Products, Inc.*

3,601,385, Senter and Johnson, ATTACHMENT FOR CHANGING REAR END SUSPENSION IN AUTOMOBILES, **filed** Sept. 29, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2346–HP, *Ansen Automotive Engineering, Inc.* v. *Roy H. Gammell et al.*

D. 213,800, David T. Ditman, PACKAGING TRAY, **filed** Sept. 10, 1971, D.C., M.D. Tenn. (Nashville), Doc. 631, *Pet Incorporated* v. *Mountain Farm Bakery, Inc.*

D. 217,331, Robert F. Bernhard, BOTTLE, **filed** July 30, 1971, D.C., N.D. Calif. (San Francisco), Doc. C–71–1449, *Pioneer Soap Co., Inc.* v. *Flexible Plastics Corp.*

Certificates of Correction for the Week of Feb. 8, 1972

3,343,053	3,578,516	3,590,434
3,437,823	3,579,353	3,590,553
3,479,852	3,579,497	3,591,059
3,498,955	3,581,091	3,592,438
3,511,599	3,581,138	3,592,507
3,513,136	3,581,971	3,593,509
3,528,489	3,582,359	3,594,092
3,529,268	3,583,227	3,594,158
3,539,689	3,583,293	3,594,441
3,542,087	3,583,304	3,594,927
3,542,737	3,583,697	3,595,177
3,548,875	3,584,766	3,595,282
3,552,700	3,585,032	3,595,491
3,555,750	3,585,237	3,595,540
3,556,299	3,585,323	3,595,641
3,557,590	3,585,344	3,596,705
3,560,273	3,585,875	3,596,780
3,563,737	3,586,928	3,597,313
3,563,985	3,587,253	3,597,472
3,564,141	3,587,383	3,599,103
3,566,172	3,587,545	3,602,812
3,566,775	3,588,358	3,603,078
3,568,777	3,588,496	3,603,701
3,571,535	3,588,950	3,606,727
3,575,463	3,589,698	3,607,114
3,576,051	3,589,898	3,607,767
3,577,528	3,589,913	3,608,016
3,578,264		

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 25, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-06-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-03-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-23-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-18-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-10-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	5-25-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-27-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-01-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-01-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	12-28-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	12-07-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	1-05-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	12-01-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-01-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	2-05-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	1-04-71

Expiration of patents: The patents within the range of numbers indicated below expire during January 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 704), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 181.

Patents..... **Numbers** 2,700,764 to 2,702,900, inclusive
Plant Patents..... **Numbers** 1,345 to 1,354, inclusive

PATENTS

GRANTED FEBRUARY 8, 1972

GENERAL AND MECHANICAL

3,639,914

METHOD OF MAKING MACHINE SEWN JACKET AND JACKET CONSTRUCTION

Harold R. Ellman, 871 Fairview Road, Highland Park, Ill.

Filed July 7, 1970, Ser. No. 52,799

Int. Cl. A41d *1/00*

U.S. Cl. 2—93 **10 Claims**

A man's jacket having a sweater-type feel sewn entirely by machine and made of stretchable materials. It includes a shoulder cap assembly blind stitch machine tacked thereto at several points only. It has the appearance of a tailored jacket, but does not require hand sewing operations conventionally used in making tailored jackets.

3,639,915

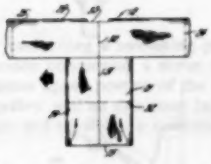
DISPOSABLE GARMENT AND METHOD AND APPARATUS FOR MAKING SAME

Frederick J. Hrubecky, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed June 20, 1969, Ser. No. 834,993

Int. Cl. A41b *9/00*

U.S. Cl. 2—114 **2 Claims**



A disposable garment is composed of a rectangular torso section having its quarter sections folded inward to define front and back panels, and a rectangular yoke and sleeve section folded longitudinally, with the torso section secured between the edges of the folds of the yoke and sleeve section. Method and apparatus are provided for making the garment from two continuous fabric webs.

3,639,916

NECKWEAR CONSTRUCTION

Richard C. Vaughn, 216 Delhi St., Syracuse, N.Y.

Filed Nov. 20, 1969, Ser. No. 878,496

Int. Cl. A41b *3/00;* **A41d** *25/04*

U.S. Cl. 2—130 **3 Claims**

Simulated cravat comprising a relatively stiff section of fabric having a knot portion and panel portion adapted to depend from the knot portion, the knot portion having wing portions extending beneath the left and right collar tab portions of a shirt, and the knot portion and the panel portion each having an aperture, the spacing between which is an exact multiple of the common shirt front button and buttonhole spacing, the cravat being combined with a shirt having a collar button and buttonhole, and shirt front buttons and buttonholes, and a buttonhole adjacent the collar button, the cravat having its knot portion secured to the shirt collar by a cuff link like fastener projecting through the knot portion aperture, and through both buttonholes, and being secured to the shirt front at the button in alignment with the panel portion aperture by a second cuff link like fastener extending through the cravat aperture, the shirt front buttonhole in alignment with said last named cravat aperture, and an additional aperture adjacent the button.

3,639,917

HEAT RECOVERABLE ARTICLE

Victor E. Althouse, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

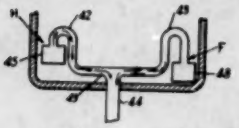
Filed Apr. 7, 1970, Ser. No. 26,347

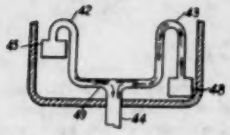
Int. Cl. A41d *27/11*

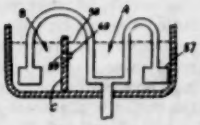
U.S. Cl. 2—270 **8 Claims**

Heat recoverable elastomeric materials are used to form gathers in fabrics, especially disposable garments of non-woven fabrics.

3,639,918
FLUSHING APPARATUS
Gobind R. Mansukhani, B7 Ananta, Rajaballi Patel Road, Bombay, 26, India
Filed Feb. 2, 1970, Ser. No. 7,699
Int. Cl. E03d 1/04, 1/06
U.S. Cl. 4—67 8 Claims



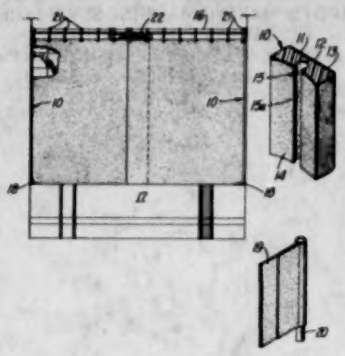




The present invention relates to a flushing apparatus. Conventional sanitary flushing apparatus generally employ either a flush or reservoir tank, or a flush valve without a reservoir tank and connected directly to water mains. Such flush tanks or flush valves usually have one lever operated by a single action, which lever when operated permits the quantity of water to flow necessary to flush out waste bulk. Such quantity, however, is in excess when waste matter is small like urine deposit.

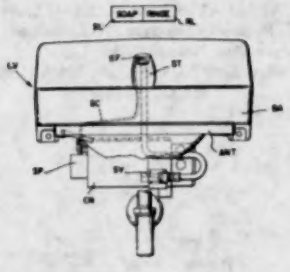
3,639,919
SHOWER CURTAIN HOLDER
Richard E. White, 7630 Willow Glen Road, Los Angeles, Calif.
Filed Sept. 2, 1970, Ser. No. 68,900
Int. Cl. A47k 3/14
U.S. Cl. 4—149 7 Claims

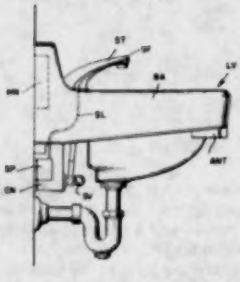
A holder for a pair of bathroom shower curtains comprising a pair of flexible seal strips permanently adhered to a bathroom wall and extending downwardly from adjacent the shower curtain rod. A pair of corner blocks permit the strip to be bent and extend across the top of the tub. Each strip has a keyhole slot extending for its entire length. The outer edge of each curtain contains a cord which is pressed into the seal strip slot to make permanent waterproof connections between the outer edges of the curtains and the bathroom walls and tub. An extension provides overlapping of the inner



edges of the curtains where they meet to prevent leakage between them.

3,639,920
PROGRAMMED PLUMBING SERVICE
James 051water will be R. Griffin, and Norman A. Forbes, both of Louisville, Ky., assignors to American Standard Inc., New York, N.Y.
Filed June 8, 1970, Ser. No. 44,501
Int. Cl. A47k 1/04
U.S. Cl. 4—166 18 Claims





Covers a proximity apparatus for a lavatory or basin or other plumbing fixture which responds to the approach of the

user to the plumbing fixture to dispense water and soap according to a predetermined pattern. Water may be turned on for a first predetermined interval, for example, when the user reaches the front of the plumbing fixture, after which the water will be briefly turned off and the soap will be turned on for another predetermined interval. Then there will be a predetermined pause during which neither soap nor water will be dispensed, after which the flow of n- stated and the flow continued until the user has departed from the plumbing fixture.

3,639,921
POOL RINK CONVERSION KIT
William J. Siler, 4029 Kingsbury Ave., Toledo, Ohio
Filed May 4, 1970, Ser. No. 34,625
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.11 **4 Claims**

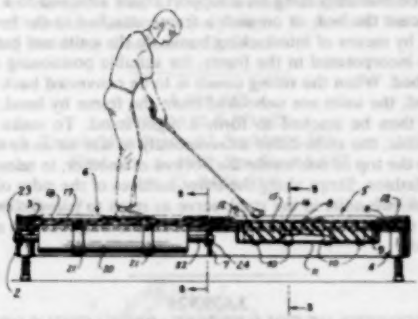
An accessory for converting a swimming pool into an ice skating rink, the device comprising a series of shields positioned around the inner upper portion of the swimming pool liner attachable together, and an extension ladder positioned upon the ice surface and to which a swimming pool ladder can be fitted.

3,639,922
CUSHIONED TOILET SEAT
Stanley J. Samuels, 2031 Locust St., and Samuel Samuels, 1801 John F. Kennedy Blvd., both of Philadelphia, Pa.
Original application July 20, 1967, Ser. No. 654,883, now Patent No. 3,513,050. Divided and this application Feb. 17, 1970, Ser. No. 14,858
Int. Cl. A47k *13/00*
U.S. Cl. 4—237 **3 Claims**

This invention comprises a cushioned toilet seat in which a foam rubber cushion element is superimposed upon a rigid base member of annular configuration, and a plastic skin is vacuum formed thereabout with lapped over heat-sealed joints at the marginal edges of the base member. Apertures in

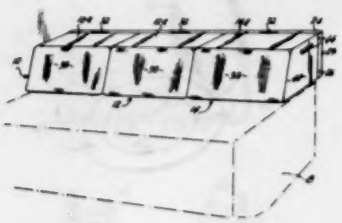
the bottom of the plastic sole sheet communicate with channels extending through the base member to permit air entrapped within the cushion to be expelled when the skin is compressed against the cushion.

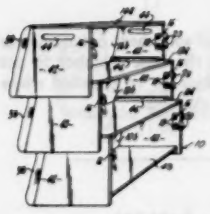
3,639,923
GOLF PRACTICE PLATFORM
Albert A. Stewart, 150 Fox Meadow Road, Scarsdale, N.Y.
Filed Nov. 25, 1970, Ser. No. 92,563
Int. Cl. A63b *69/36*
U.S. Cl. 273—187 R **4 Claims**



A golf practice platform is divided into two sections one of which is stationary, and the other of which is mounted to tilt slightly as the golfer's weight shifts from one foot to the other in order to indicate the instant when the shift occurs. Each section has an artificial turf surface and the turf surface of the stationary section from which the ball is driven is laid above a pad of cellular elastomeric material to simulate actual playing conditions. The entire platform may be tilted in various directions to simulate uphill, downhill and sidehill lies.

3,639,924
STACKABLE FURNITURE UNITS
Peggy Snider Cadle, 1283 Bell St., San Bernardino, Calif.
Filed Dec. 29, 1969, Ser. No. 888,797
Int. Cl. A47c 13/35, 4/02
U.S. Cl. 5—2 8 Claims



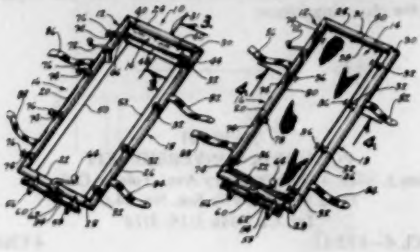


Three stackable units which can be arranged above the top of a twin bed to convert the bed into a sitting couch. The units are hollow and have steeply sloping fronts, enclosed sides and enclosed tops. The sloping fronts are upholstered, and serve as backrests for those using the couch. The units can be manually hung on a support frame attached to a wall adjacent the bed, or on such a frame attached to the bed itself, by means of interlocking hooks on the units and bars or pins incorporated in the frame, for suitable positioning over the bed. When the sitting couch is to be converted back into a bed, the units are unhooked from the frame by hand, and can then be stacked to form a night stand. To make this possible, the units differ incrementally in size so as to stack with the top of one inside the bottom of another, in telescoping fashion. Strips along the inner surfaces of the sides of the upper two units in the stack serve as stops to prevent excessive telescoping of the units and to fix the height of the night stand.

3,639,925
RECOVERY OF GOLD FROM CARBONACEOUS ORES
Bernard J. Scheiner, Sparks; Ronald E. Lindstrom, Reno, both of Nev., and Thomas A. Henrie, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Interior
Original application May 15, 1968, Ser. No. 729,382, now Patent No. 3,574,600. Divided and this application Nov. 17, 1970, Ser. No. 90,428
Int. Cl. C22b 11/08
U.S. Cl. 75—101 R 5 Claims

Carbonaceous gold ores are rendered amenable to a conventional cyanide recovery process by pretreatment with sodium hypochlorite or calcium hypochlorite compounds at temperatures under 70° C. Hypochlorite solutions can be generated in situ by electrolysis of chloride solutions.

3,639,926
LITTER DEVICE
Gerald E. Steelman, R.R. #3, Adel, Iowa
Filed July 2, 1970, Ser. No. 52,022
Int. Cl. A61g 7/10, 1/02
U.S. Cl. 5—81 10 Claims



A litter device comprising a frame means having opposite side members and opposite end members and having a rectangular flexible sheet member supported thereon. The sheet member is initially secured at one end thereof to one end of the frame means and is pulled beneath the person by means of a winch means or the like operatively connected to the other end of the frame means and having a cable means extending to the sheet member. After the sheet member has been pulled beneath the person, one side of the sheet member is secured to one side of the frame means. The other side of the sheet member is then connected to a tensioning means mounted on the other side member to enable the sheet member to be drawn to a taut condition between the side members of the frame. A strap means is provided on the frame means for maintaining the person on the sheet member for transportation purposes.

3,639,927
MATTRESS FOR INVALIDS
Josef Munch, Duisburg-Hamborn, Germany, assignor to Firma Otto Bock Orthopadische Industrie KG., Duderstadt, Germany
Filed May 4, 1970, Ser. No. 34,094
Claims priority, application Germany, May 7, 1969, G 69 18 374
Int. Cl. A61g 7/02
U.S. Cl. 5—91 8 Claims

A frame of foam polymer with a rectangular cutout, positioned to underlie the major part of the body of a patient recumbent thereon, rests on a baseplate serving as a support for a multiplicity of square or rectangular inserts of like foam material detachably pasted onto the base so as to be removable at locations proximal to a pressure-sensitive part of the patient's body. A transverse pad at the foot end of the mattress has vertical recesses open toward the head end to receive the feet of the patient whose legs rest on anatomically shaped wedge pieces which extend into these recesses but terminate short of their closed ends to leave room for the unsupported heels of the patient.

3,639,928

ACCELERATOR COMBINATION FOR EPOXY CURING

Floyd Edward Bentley, and Norman Bell Godfrey, both of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Nov. 27, 1970, Ser. No. 93,431
Int. Cl. C08g 30/14
U.S. Cl. 260—47 EC 5 Claims

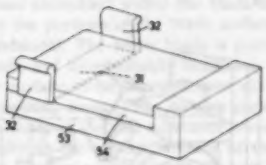
An accelerator combination of N-(3-aminopropyl)piperazine and salicylic acid is synergistic for accelerating the cure of a polyglycidyl ether of a polyhydric phenol cured with a polyoxyalkylenepolyamine. The epoxy resin product is useful in castings, coatings, adhesives, laminates, filament reinforced compositions, seamless flooring, terrazo flooring, crushed-stone aggregates and in grouting, caulking and sealing compositions.

3,639,929

COMBINATION LEG/FOOT REST AND BED COVER RETAINER

Noboru Ichise, No. 18, 3-chome, Takaidahondori, Higashiosaka-shi, Osaka-fu, Japan

Filed Sept. 29, 1969, Ser. No. 861,623
Claims priority, application Japan, Aug. 15, 1969, 44/64900
Int. Cl. A47c 21/02, 21/08
U.S. Cl. 5—327 5 Claims



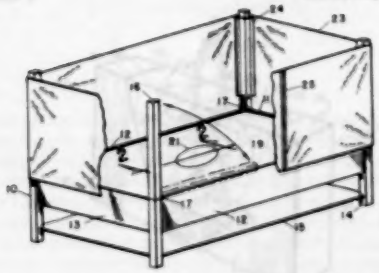
A leg and foot rest device to alleviate leg and foot fatigue, which device is readily insertable between the mattress and its support of a bed, to project from lateral sides thereof and also acts not only as a leg and foot rest, but also to preclude both the bed covers and occupant from inadvertently inadvertently off the bed, as contrasted to means elevating bed covers at the lower end of the bed to preclude contact thereof with the occupants legs and feet.

3,639,930

HUMIDITY TENT

Gary E. Miller, 333 North Liberty St., Delaware, Ohio

Filed Aug. 14, 1970, Ser. No. 63,776
Int. Cl. E03d 11/10; A47c 21/00
U.S. Cl. 5—330 3 Claims



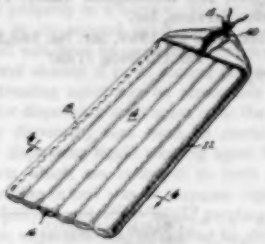
A bed with folding integral corner posts for holding a privacy screen or an oxygen tent and equipped with a sectional, invalid-type mattress and has integral storage provisions for said privacy screen and a conventional bed pan.

3,639,931

SLEEPING BAGS

William L. McGuire, Seattle, Wash., assignor to Eddie Bauer, Inc., Seattle, Wash.

Filed Feb. 2, 1970, Ser. No. 887,033
Int. Cl. A47g 9/00
U.S. Cl. 5—343 2 Claims



This invention provides a sleeping bag which is formed of a double length insulated structure folded upon itself. Slide fastener means joining the side edges are separable adjacent the fold, the separable elements being reversely arranged at the sides of the folded structure whereby two or several such sleeping bags may be joined together side by side.

3,639,932

RARE EARTH OXIDE PHOSPHOR HAVING A CONTROLLED DECAY TIME

John L. Ferri, Towanda, and James E. Mathers, Ulster, both of Pa., assignors to Sylvania Electric Products Inc.

Filed Nov. 13, 1970, Ser. No. 89,473
Int. Cl. C09k 1/10
U.S. Cl. 252—301.4 R 8 Claims

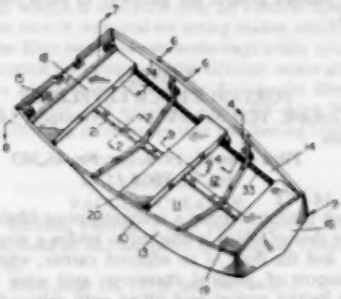
A cathodoluminescent phosphor composition with a controlled decay time is disclosed wherein the phosphor consists of a matrix of Y_2O_3 contaminated with dysprosium, and a dopant of europium and a predetermined amount of at least one of terbium and praeseodymium. A process for controlling the decay time is also disclosed.

3,639,933

FOLDABLE BOATS

James L. Trowbridge, Route #2, Neshkoro, Wis.

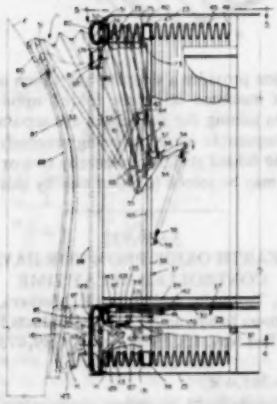
Filed Aug. 6, 1970, Ser. No. 61,647
Int. Cl. B63b 7/00
U.S. Cl. 9—2 F 11 Claims



A foldable boat having removable end panels, a pair of hinged bottom panels and a pair of side panels each of which

is hingedly connected to one of the bottom panels. The hinged connections are provided by flexible, water-resistant fabrics secured to the connected members, and compressible gaskets are employed between connected members to provide a watertight seal. The hinged panels are maintained in their open, watertight position by transverse ribs, the removable end panels, and seats which are removably attached to the side panels and end panels.

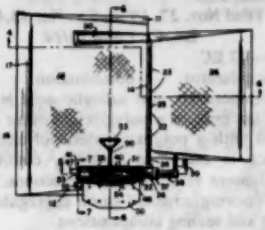
3,639,934
CANOPY APPARATUS
Walter S. Eggert, Jr., Huntingdon Valley, Pa., assignor to Boothe Airside Services, Inc.
Filed Sept. 25, 1969, Ser. No. 860,882
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 **17 Claims**



A flexible canopy extendable from an aircraft passenger transfer vehicle for mating with passenger airplanes having different fuselage airfoil shaped configurations. The gangway includes a rigid upright frame which carries a pivotal bow frame from its upright sides and includes a lower frame having a threshold plate which is extendable from the gangway. The lower frame includes a crossbar which is connected to the upper bow frame and includes bumpers which encircle the doorway opening in the aircraft. The frames stretch a flexible bellows around the gangway to keep out wind and weather.

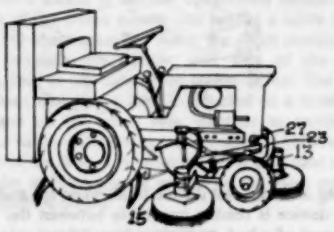
3,639,935
PORTABLE DOCK LEVELLERS
Karl Kumpolt, 1820 Selkirk Ave., Winnipeg, 14 Manitoba, Canada
Filed June 15, 1970, Ser. No. 46,383
Int. Cl. E01d *15/12*
U.S. Cl. 14—72 **5 Claims**

A dock platform having a resiliently pivot-liftable wing on one side thereof which is adapted to bridge a space between a dock and the floor of an adjacent carrier, when lowered, for transport of material thereover, said wing being frictionally locked against said lifting until released by a foot pedal; ground wheels rockably mounted on one side and a castered dolly hinged to the opposite side of the platform, and said parts interconnected, for raising the platform thereon to an elevated and locked position by a lever, for portability of the platform and wing; and a second foot pedal



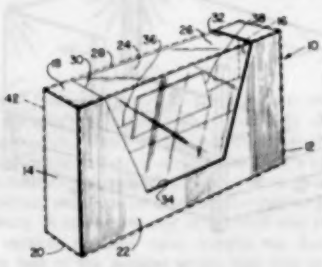
for the release of the platform from said elevated and locked position onto the dock.

3,639,936
SELF-PROPELLED FLOOR SCRUBBER
Walter G. Ashton, Winnetka, Ill., assignor to Star Industries, Inc., Chicago, Ill.
Filed June 8, 1970, Ser. No. 44,168
Int. Cl. A47l *11/29*
U.S. Cl. 15—4 **8 Claims**



A hydraulic motor-propelled occupant-driven floor scrubber having a subframe supporting structure for rotating brushes and squeegee assemblies that are each independently hydraulically movable into and out of operating floor-engaging position, with each of the subframe structures having floating shock-absorbing arrangements.

3,639,937
DISPOSABLE SELF-PACKAGING DUSTPAN KIT
Robert Sweeney, 10 Wilton Drive, Wilmington, Mass.
Filed July 17, 1969, Ser. No. 842,668
Int. Cl. A46b *17/08*; **A47l** *13/42*, *13/52*
U.S. Cl. 15—104.8 **6 Claims**



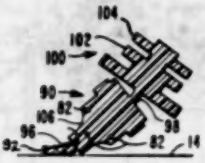
A disposable carton is provided with a charge of granular absorbent material. The package is formed with at least one

flat wall, one edge of which is contiguous to a removable panel whereby the package may be opened, the contents distributed over spillage and swept back into the box by means of an included paddle.

3,639,938
WINDSHIELD-CLEANING SYSTEM

Gerald J. Golden, 875 Comstock, Apt. 4A, Los Angeles, Calif.

Filed Oct. 15, 1969, Ser. No. 866,476
Int. Cl. B60s 1/38; A47l 1/16
U.S. Cl. 15—250.06 **13 Claims**



A windshield-cleaning system, especially useful for cleaning automobile windshields of layers of adhering ice, is disclosed. The system includes wiper blades each having electrical heating means embedded within the blade to establish a heating zone on the portions of the blade surface adapted to contact the windshield. The wiper blade is normally curved and is transversely and longitudinally flexible so as to readily conform to the surface to be wiped despite the presence of the embedded heating means. The heating means may take the form of a number of flexible resistance wires in an array in close proximity to the wiping surfaces of the blade and connected to an external supply circuit through wires having high fatigue strength. The blades are driven across the windshield by an electromechanical system whose operation may be controlled independently of the blade heating circuit. An automatic control circuit for energizing the wiper-heating wires when the windshield temperature drops below a predetermined level during operation of the wiper drive mechanism, is also disclosed.

3,639,939
COMBINATION SURFACE TREATING AND SUCTION CLEANING APPARATUS

Bengt Olof Crener, Taby; Erik Arne Anderson, Hagersten, and Stig Carl-Oskar Ernolf, Sollentuna, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

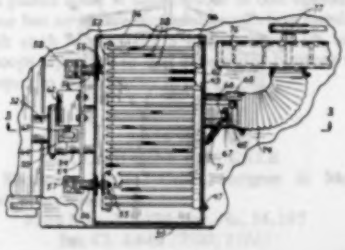
Filed Dec. 11, 1969, Ser. No. 884,166
Claims priority, application Sweden, Dec. 11, 1968, 16899/68
Int. Cl. A47l 11/206
U.S. Cl. 15—320 **15 Claims**

This invention relates to a combined surface treating and polishing and suction cleaning apparatus having rotatable brushes movable over a surface. A movable control shutter in a first position covers an opening in the air passageway of the suction cleaning component of the apparatus so that it will operate properly as a suction cleaner. When the control shutter is in its first position mechanism for dispensing liquid wax from a container onto the surface is rendered inoperable. When the control shutter is in its first position a vessel for holding a body of liquid treating agent cannot be removably mounted on the apparatus for dispensing such liquid onto the surface. In the second position of the control shutter the opening in the passageway of the suction cleaning component is uncovered so that atmospheric air will be drawn into the air passageway by a fan and the apparatus cannot operate properly as a suction cleaner. When the control shutter is in its second position the mechanism for dispensing liquid wax from its container is rendered operable. When the control shutter is in its second position the vessel for the liquid treating agent can be removably mounted on the apparatus for dispensing such agent onto the surface. The mechanism for dispensing wax from its container and the mechanism for dispensing liquid treating agent from the vessel include parts which are common to both mechanisms, such parts operating in one way to dispense liquid wax from its container when the vessel for liquid treating agent is not mounted on the apparatus and operating in another way to dispense liquid treating agent from the vessel when it is mounted on the apparatus.

3,639,940
FILTER CHAMBER

Alfred D. Carlson, and Joseph G. Kasper, both of Minneapolis, Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Aug. 22, 1969, Ser. No. 852,326
Int. Cl. A47l 9/20
U.S. Cl. 15—352 **9 Claims**



A filter chamber including a shaking mechanism for vibrating dust from filter bags in a sweeping machine wherein an eccentric weight is mounted onto an electric motor, and the motor in turn is mounted on spring means which are attached to the filter bags and retain the bags under spring tension. The control for turning on the vibrator motor also controls a valve which shuts off vacuum flow to the filter compartment so that the dust will more easily fall down from the sides of the filter bag at the same time the shaking occurs.

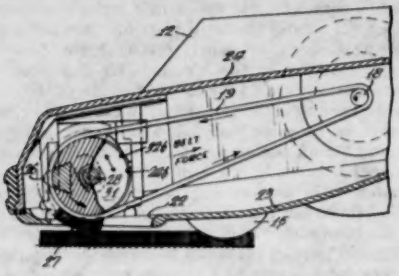
3,639,941
VACUUM CLEANER

Warren J. Kirwan, Melrose Park, and Elmer E. Bruning, Westmont, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed June 16, 1970, Ser. No. 46,615
Int. Cl. A47l 5/34
U.S. Cl. 15—372 **8 Claims**

A rotary brush for a vacuum cleaner including mounting means for biasing the brush downwardly against the rug

through the use of the tension applied by the belt drive from the motor.

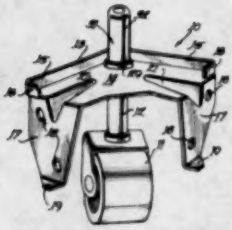


3,639,942

CASTER BRACKET ASSEMBLY

Martin E. Ostrom, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Dec. 22, 1969, Ser. No. 886,959
Int. Cl. B60b 33/00
U.S. Cl. 16—29 8 Claims



A caster bracket assembly to mount a caster onto the interior surface of a furniture base utilizing a one-piece caster bracket having an integral caster socket or a separate caster socket secured thereto. The caster bracket and socket are both formed of the same or similar materials, and the bracket has a pair of legs or flanges with means to fasten the bracket legs to the interior surface of the furniture piece and positioning flanges or tabs engaging the lower edges of the furniture piece.

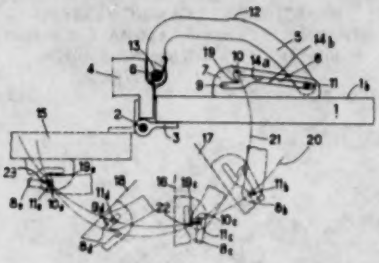
3,639,943

DOORSTOP MEANS

Jean G. Cadiou, Saint-Cloud, France, assignor to Citroen S.A., Paris, France

Filed Aug. 21, 1969, Ser. No. 851,993
Claims priority, application France, Sept. 6, 1968, 165393
Int. Cl. E05f 5/14
U.S. Cl. 16—82 2 Claims

This invention relates to a doorstop means particularly for a motor vehicle, and in which a draw rod is articulated at one end to the door upright by means of a pin that is substantially parallel to and spaced from the hinge pin and the door itself. The other end of the draw rod carries a finger movable in a slotted member secured to the door, the slot running parallel to the door plane but branching into two extensions of the end nearest the hinge pins, one extension curving inwardly towards the door but the other extension extending substantially perpendicularly to the door to form a catch in which the finger on the draw rod engages to lock the door in a fully open or an intermediate position.

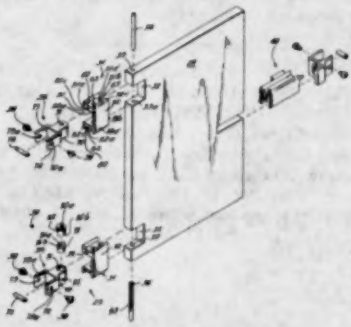


3,639,944

HINGE ARRANGEMENT INCLUDING A PARTIALLY CONCEALED MEANS FOR SECURING WITH A SWINGING DOOR

Ralph B. Mott, Sr.; Ralph B. Mott, Jr., and Richard C. Cantella, all of Houston, Tex., assignors to Reserv-A-Roll Co., a partnership composed of Ralph Beach Mott, Sr. and Ralph Beach Mott, Jr., by said Cantella

Filed Nov. 3, 1970, Ser. No. 86,513
Int. Cl. E05f 1/06
U.S. Cl. 16—153 5 Claims



A hinge arrangement including a hinge housing and a hinge bracket for hingedly or swingingly supporting a swinging door adjacent a stationary wall surface. The means for securing the hinge arrangement to the swinging door is partially concealed so as to inhibit attempts at removal of the hinge arrangement either by vandalism or idle curiosity. The hinge arrangement is also constructed to present a smooth uninterrupted surface on the exterior of the door while having a minimum number of exposed screws or other securing means. The arrangement for maintaining the swinging door in a partially open position is such that it can be quickly and easily adjusted to maintain the door in any desired partially open position.

3,639,945

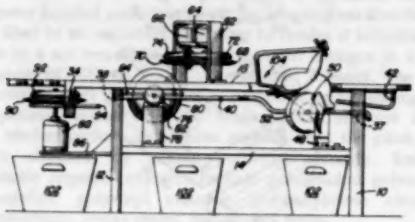
POULTRY CUTTER

William D. Duncan, and Carolyn L. Duncan, both of Route #4, Box 46A, Kokomo, Ind.

Continuation-in-part of application Ser. No. 779,990, Nov. 8, 1968, now abandoned, Continuation-in-part of application Ser. No. 682,955, Nov. 14, 1967, now abandoned. This application Aug. 21, 1970, Ser. No. 66,038

Int. Cl. A22c *21/00*

U.S. Cl. 17—11 31 Claims



Apparatus for automatically sectioning poultry into a predetermined number of pieces comprising a pair of cutting blades for severing the wings, a pair of cutting blades for severing the breast and legs, a cutting blade for splitting the poultry into two pieces and a cutting blade for severing the thighs from the ribs whereby the poultry is sectioned into nine pieces. A first embodiment utilizes a carriage attached to conveyor chains for moving poultry past the cutting blades, and a second embodiment is vertically aligned to allow gravity to move the poultry past the cutting blades. Another embodiment includes a mechanism for folding the severed wing portions.

3,639,946

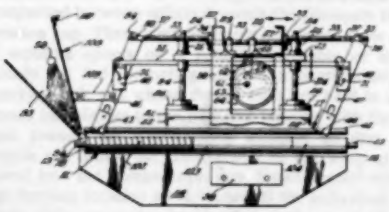
SHRIMP-PROCESSING APPARATUS

Clyde J. Welcker, and Roland Welcker, both of New Orleans, La., assignors to The Welcker Corporation, New Orleans, La.

Filed Feb. 2, 1970, Ser. No. 7,526

Int. Cl. A22c *29/00*

U.S. Cl. 17—71 13 Claims



An apparatus for processing shrimp and like marine life of the type utilizing a pair of horizontally extending, parallel rollers spaced apart a distance to accommodate a centerplate for defining a processing channel and also including an elongated impeller overlying an upper edge of the centerplate is characterized as having mechanical drive means including cams and eccentrics for operating the centerplate and the impeller from a single rotating line shaft. The cam means is arranged and configured to drive the centerplate and the impeller in undulatory patterns having both horizontal and vertical components of movement selected to operate on the marine life in conjunction with the rollers for peeling, deheading, deveining and otherwise cleaning the marine life and moving the same from an inlet end of the machine to a discharge end thereof. Further, the machine characteristics including cycle speeds, size and surface finish of the rollers and configuration of the centerplate have been optimized for most varieties of shrimp.

3,639,947

CLOSURE DEVICE FOR FOOD-CONTAINING BAGS AND THE LIKE

Myron Jenner, Bethel, Vt.

Filed Jan. 21, 1969, Ser. No. 792,705

Int. Cl. B65d *77/10*

U.S. Cl. 24—30.5 R 5 Claims

The disclosure sets forth an S-shaped double multicoil device for engaging open necks of bags and affording a temporary removable and replaceable closure thereof and for other purposes. The device is formed by winding wire on an automatic coil winder to form spaced coils having about one inch diameter, each of which is about 1¾ tightly wound turns which are spaced ⅛ inch or ¾ inch apart. The spacing may in general determine the generation of the interconnection curve. The double coils are then turned away from each other and pulled apart in sequence or in one operation. The final device has an oblique integral connection forming an S-shape with each loop of the S having about 1¾ turns and with the loops separated so that the spacing between the coils is about equal to the diameter of a coil.

3,639,948

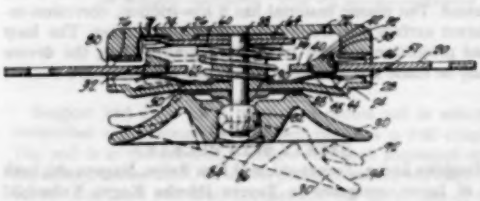
MULTIHARNESS BUCKLE

Gale K. Sherman, Tustin, Calif., assignor to McDonnell Douglas Corporation

Filed Mar. 3, 1970, Ser. No. 16,157

Int. Cl. A44b *17/00*, *11/25*

U.S. Cl. 24—205.17 8 Claims

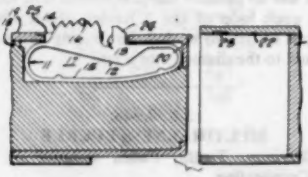


A buckle for attaching and releasing one or more harnesses used to strap cargo or occupants of a moving vehicle securely in place. A sequential method is provided for release of selected harnesses while retaining others permanently or for subsequent release. A tiltable release handle tilted to a first position aligns certain captive toggles for release from locked position and further tilt to a second position releases others.

3,639,949
ORNAMENTAL SCARF CLIP
George R. Beck, 775 16th St., Boulder, Colo.
Filed May 14, 1969, Ser. No. 824,652
Int. Cl. A41d 25/04
U.S. Cl. 24—49 O 5 Claims

A scarf clip, comprising a base hinged to a ring at its rear surface, is provided on its front surface with resilient clips or magnetic studs to retain a fastening pin of a brooch or similar ornament interchangeably supported thereon.

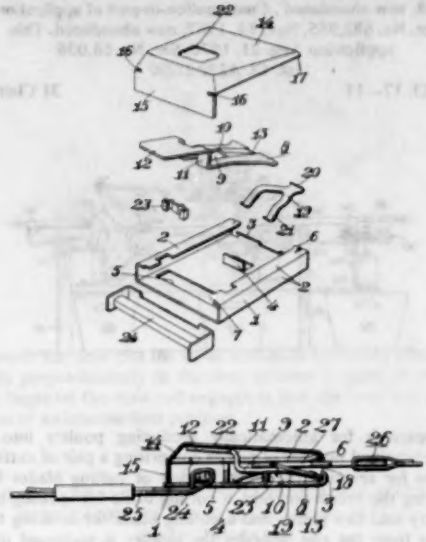
3,639,950
LATCHING DEVICE
Leland H. Lutz, Los Angeles; Richard C. Heileman, Whittier; Harlan R. Upstone, Arcadia; John M. Leonard, Buena Park, and Melvin A. Ottow, Duarte, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Sept. 13, 1968, Ser. No. 759,723
Int. Cl. A44b 17/00
U.S. Cl. 24—230 1 Claim



The invention includes a closed loop of a plastic material which has a projection molded integrally therewith to act as a detent. The detent is released by squeezing the loop together. The loop is resilient and springs back for engagement of the detent. The plastic material has a low-friction, corrosion-resistant surface for trouble-free detent operation. The loop and projection may be molded integrally. Thus, the device may be made and assembled easily and quickly at low cost.

3,639,951
SAFETY BELT BUCKLE
Masahiko Inoue, Toyota-shi, and Ken Tojyo, Nagoya-shi, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi and Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun, Japan
Filed Feb. 26, 1969, Ser. No. 802,535
Claims priority, application Japan, Mar. 1, 1968, 43/15756
Int. Cl. A44b 11/26
U.S. Cl. 24—230 4 Claims

A safety belt buckle so constructed that the minimum number of components are employed for convenience and simplicity of assembling; a movable portion is enclosed by a cover plate and a baseplate so as to be protected from an unexpected impact of any other object, in order to preclude an unexpected disengagement of the tongue from a latched position; and disengagement of the tongue is precisely effected only by pressing on it by means of a finger inserted through an aperture on the cover plate, but is not unexpectedly effected as a result of the force of inertia exerted thereon on collision.



3,639,952
SAFETY PACKAGE ASSEMBLY AND DIVIDER CLAMP THEREFOR
John T. Thompson, 244 Loring St., Los Angeles, Calif., and George W. Gillemot, 2331 20th St., Santa Monica, Calif.
Filed Oct. 27, 1969, Ser. No. 869,504
Int. Cl. B65d 77/10
U.S. Cl. 24—255 BC 8 Claims

A divider clamp assembly having many uses such as isolating reactive potting compound constituents in a flexible walled package assembly until the constituents are ready for use.

3,639,953

METHOD OF PRODUCING CARBON FIBERS

Isao Kimura, and Hidetsugu Habata, both of Osaka, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1970, Ser. No. 60,608
Claims priority, application Japan, Aug. 7, 1969, 44/62461; Sept. 30, 1969, 44/78353; 44/78354
Int. Cl. C01b *31/07*
U.S. Cl. 23—209.1 20 Claims

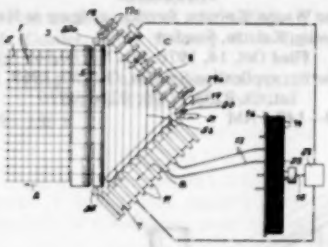
Nonflammable fibers are produced by subjecting a composite fiber comprising a pitch and a synthetic organic polymer bonded uniformly along the longitudinal direction of the fiber to an oxidation treatment to render it infusible and then to a set treatment in air or gaseous nitrogen at a temperature of 200° to 500° C. for at least 2 hours. The nonflammable fiber is converted to carbon fiber by heating to a temperature higher than 800° C. in gaseous nitrogen. Suitable pitches include petroleum asphalt, coal tar pitch, and pitch obtained by baking polyvinyl chloride. Suitable synthetic organic polymers include polyamides, polyesters, polyolefins, polyvinyl chloride, polyvinylidene chloride, polyurethane, epoxy resins, and phenol resins.

3,639,954

APPARATUS FOR MAKING A REINFORCED WEB

Horst Kirzinger, and Alfons Kirzinger, both of Neustadt, Germany, assignors to KIRSON Patentverwertung und Vertriebsgesellschaft mbH, Neustadt, Germany

Filed Dec. 31, 1969, Ser. No. 889,565
Int. Cl. D04h *3/04, 3/14*
U.S. Cl. 28—1 CL 4 Claims



A filamentary web intended to be imbedded in a synthetic-resin sheet is made by inserting a succession of weft or transverse filaments into a continuously moving warp of longitudinal filaments at a web-forming location at which the web is compacted between rollers drawing the filaments into a compression gap. These weft filaments are drawn from a plurality of separate spools on a rotating turntable or disk whose threads are fed through guides on a continuously moving conveyor belt and whose thread ends are held in clips on a second belt similar to the first and forming with the first a V open toward the web-forming location so that the weft threads are drawn out transversely to the warp as they are moved into the compression gap. Small heated wires at the web-forming location serve to cut off the individual weft filaments while apparatus is provided at the apex of the V to reengage the free end of each thread in its clip.

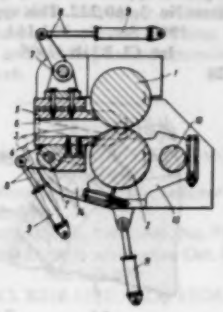
3,639,955

APPARATUS FOR CRIMPING GROUPS OF SYNTHETIC FILAMENTS

Heinz Fleissner, and Gerold Fleissner, both of Egelsbach, Germany, assignors to Vepa Ag.

Filed Dec. 19, 1969, Ser. No. 886,737
Claims priority, application Germany, Dec. 20, 1968, P 18 16 028.6
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.6 14 Claims

The present disclosure is directed to an improved device for crimping groups of textile filaments, for example, synthetic filaments utilizing a pair of rollers and a compression compartment. The device produces a uniform crimp and contains features which facilitate the cleaning and maintenance thereof.

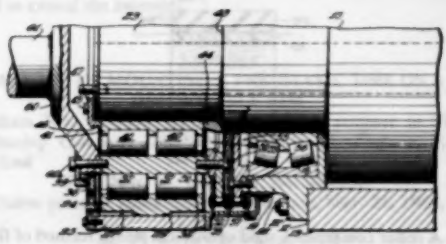


3,639,956

BEARING SUPPORT AND DRIVE FOR CONTROLLED CROWN ROLL

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of application Ser. No. 457,753, May 21, 1965, now Patent No. 3,286,325, dated Nov. 22, 1966. This application June 25, 1965, Ser. No. 467,035
Int. Cl. B21b *13/02*
U.S. Cl. 29—116 20 Claims



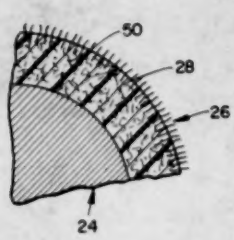
Support and drive for a controlled crown roll in which a controlled nip pressure is obtained between a roll couple. The roll is in the form of a hollow roll shell journaled on a stationary center shaft, in which pressure means between the center shaft and roll shell compensate for deflection of the shaft by the nip correcting pressure on the roll shell. The shaft is journaled at its ends in pedestals and one end of the shaft extends beyond the end of its pedestal to afford a means for holding the shaft from rotation and to adjust the position of the shaft with respect to the roll shell. A drive sleeve is journaled in this housing on one set of bearings and is journaled on the shaft on an aligned set of bearings and has driving connection with the roll shell. A torque-transmitting drive connection is provided between the sleeve and the shell.

3,639,957

PAPER MANUFACTURING ROLL CONSTRUCTION AND PROCESS

Paul J. Mitchell, Jr., Griffin, Ga., assignor to SW Industries, Inc., Newton, Mass.

Continuation-in-part of application Ser. No. 606,412, Dec. 30, 1966, now Patent No. 3,460,222. This application June 6, 1969, Ser. No. 831,161
Int. Cl. B21b 31/08
U.S. Cl. 29—120 2 Claims



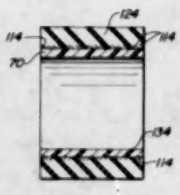
In a paper making machine, following casting of the aqueous pulp suspension onto a moving web and partial drainage of water therefrom to form a wet sheet, water is pressed from the wet sheet by rolls that are characterized by a covering composed of a butadiene acrylonitrile elastomer and a dispersion of hydrophobic fiber strands penetrating through the outer surface of the elastomer. Such rolls have superior release characteristics with respect to the wet sheet.

3,639,958

ROLLER AND METHOD OF MAKING SAME

Wilfred Griffiths, New South Wales, Australia, assignor to Abrasive Aids Pty. Limited, Banktown, Australia

Filed May 16, 1969, Ser. No. 825,174
Int. Cl. B60b 7/04
U.S. Cl. 29—130 8 Claims



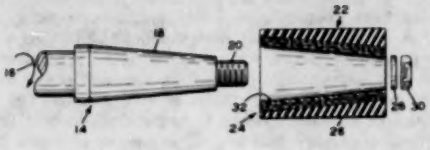
A roller comprises a rigid cylindrical sleeve formed of fiber glass which is coated with resin. The outer surface of the sleeve is machined to remove substantially all visible resin therefrom and to expose the fiber glass. The fibers of the fiber glass provide substantially fuzzy surface characteristics on the outer surface of the sleeve. An elastomeric sleeve is molded around the outer surface of the rigid sleeve. Fibers of the fiber glass extend into the elastomeric sleeve and define a zone having an elasticity modulus which is between that of the rigid sleeve and the elastomeric sleeve. The roller is formed by coating fiber glass filaments with resin and winding them upon a rotating mandrel. When a desired thickness of resin coated filaments are on the mandrel, the filaments are cut and the assembly is heated to partially cure the resin while the mandrel is rotated. Following the final curing of the rigid sleeve, it is placed in a lathe where its outer surface is machined to remove free visible resin on its exterior surface and to expose the fiber glass fibers. The exterior of the rigid sleeve is then coated with a bonding agent and an elastomeric sleeve is bonded to its exterior surface.

3,639,959

GLASS FIBER CORD RUBBER ROLLER

Donald H. Bagley, East Freetown, and Robert G. Cook, South Weymouth, both of Mass., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Mar. 23, 1970, Ser. No. 21,604
Int. Cl. B21b 31/08
U.S. Cl. 29—132 1 Claim



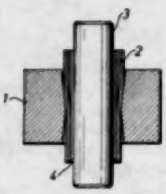
A rubber coated roller is provided with a tapered core of a glass fiber material bonded in a phenolic resin. The glass fiber core roller is then mounted on a tapered shaft. Two adjacent rollers coact together to drive a yarn positioned between two rollers.

3,639,960

METHOD OF APPLYING A LUBRICATING AND FRICTION-REDUCING LAYER ON THE INNER SURFACE OF A TUBULAR BODY OF METALLIC MATERIAL

Bard Meyer Waage, Knivsta, Sweden, assignor to Habia Kommanditbolag, Knivsta, Sweden

Filed Oct. 14, 1970, Ser. No. 80,569
Claims priority, application Sweden, Oct. 20, 1969, 14378/69
Int. Cl. B23p 11/00; B21d 53/10
U.S. Cl. 29—149.5 NM 3 Claims



A method for applying a lubricating and friction-reducing layer on the inner surface of a tubular metallic body comprising the steps of applying a lubricating and friction-reducing coating on the inner surface of the body and thereafter subjecting said coating to a deformation calibration by means of a bearer.

3,639,961

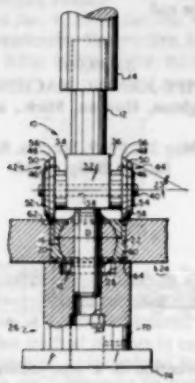
METHOD AND TOOL FOR SECURING A BEARING RACE WITHIN A BORE IN A HOUSING

Robert H. Shiflet, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed Feb. 9, 1970, Ser. No. 9,865
Int. Cl. B23p 11/00, 19/00
U.S. Cl. 29—149.5 B 8 Claims

An annular shoulder which retains a bearing race in a bore in a housing is swaged by beveled rollers mounted on a rotatable spindle. Pressure exerted by the rollers against the shoulder is maintained at a first predetermined level during

at least half of a revolution of the spindle, then is increased to a second predetermined level while the spindle continues to rotate, and finally is maintained at the second level during



at least half of a revolution of the spindle. The bevel of the rollers, radius of their larger diameter edges, and distance between their inner sides are designed to provide proper swaging of the shoulder.

3,639,962

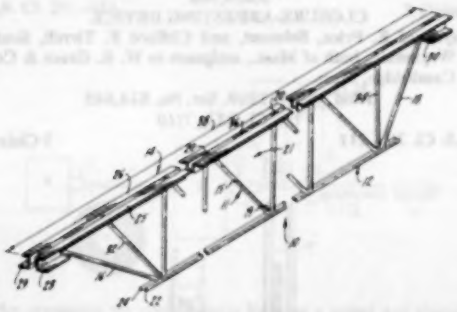
SYSTEM FOR FABRICATING STRUCTURAL MEMBERS

Robert M. Gooder, 2537 Country Club Drive, Olympia Fields, Ill.

Filed Feb. 11, 1970, Ser. No. 10,324

Int. Cl. B23p *17/00, 19/00*

U.S. Cl. 29—155 R **19 Claims**



An apparatus and process for completing the assembly of a joist including a support platform adapted to carry a joist in a generally horizontal orientation with a bottom chord extending along one side and a top chord extending along an opposite side, rollers carried by said support platform each having a plurality of laterally spaced recesses, ones on different rollers being generally aligned to receive said lower chord, a set of movable clamping bars located above said rollers, having laterally spaced gripping troughs adapted to cooperate with said roller recesses to selectively grip said bottom chord, two sets of laterally movable roller wheels having stationary baseplates associated therewith and being longitudinally spaced along a top chord side of said support platform, a first set positioned below or on an underside of said top chord and a second set positioned above or over said top chord, a set of clamping fingers interposed between said second set of roller wheels actuatable to engage said top chord and clamp the top chord and web together against the lower set of roller wheels, pneumatic means associated with said movable clamping bar, said first and second set of roller wheels and said clamping fingers, responsive to actuation of electrical controls firstly, to grip the lower chord, secondly, to laterally press said respective lower and upper sides of the top chord against said stationary plates, thirdly to clamp said top chord and web together, and welding means operative to weld said top chord to said web.

3,639,963

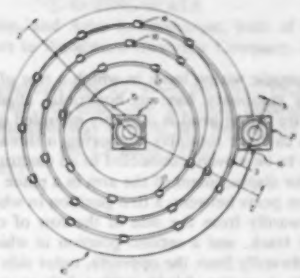
METHOD OF MAKING A HEAT EXCHANGER COIL ASSEMBLY

Frank A. Maher, Mount Prospect, Ill., assignor to Vapor Corporation, Chicago, Ill.

Original application Apr. 1, 1968, Ser. No. 717,516, now abandoned. Divided and this application Oct. 8, 1969, Ser. No. 868,970

Int. Cl. B21d *53/02;* **B23p** *15/26*

U.S. Cl. 29—157.3 R **4 Claims**



Method of making a heat exchanger coil assembly for a steam generator including coil turns arranged in concentric layers and spaced apart by spacer members, and including the step of dip soldering the assembly for securing the turns and spacer members together to form a unitized assembly and to anneal the assembly.

3,639,964

METHOD OF MOUNTING A PNEUMATIC TIRE ON A DEFORMABLE RIM

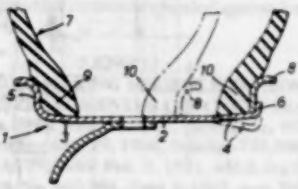
William Eric Mitchell, Coventry, England, assignor to The Dunlop Company Limited, Erdington, Birmingham, England

Filed Mar. 12, 1969, Ser. No. 806,658

Claims priority, application Great Britain, Mar. 21, 1968, 13,682/68

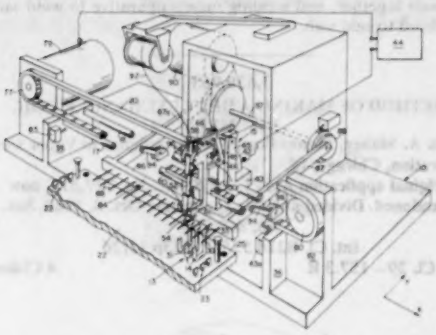
Int. Cl. B21h *1/02;* **B21k** *1/32*

U.S. Cl. 29—159.01 **5 Claims**



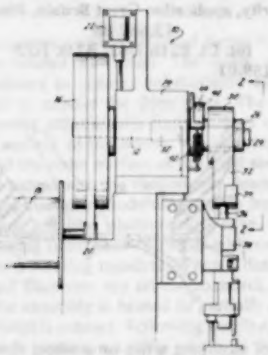
A method of mounting a tire on a wheel rim having an inwardly depressed bead seat and a detachable flange comprising arranging the tire on the rim and then expanding the bead seat to hold the tire and the detachable flange permanently in position.

3,639,965
WIRING LOOM
Ge Yao Chu, Lincoln, Mass., assignor to Wang Laboratories, Tewksbury, Mass.
Filed Mar. 19, 1970, Ser. No. 21,083
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 MM 6 Claims



An automatic wiring loom in which a row of core posts is held on a stationary base in horizontal alignment with a track, a wire laying head is movably mounted on a track and includes a carriage rotatably supporting a threading arm carrying wire to be woven, connected to an electrically operated solenoid for displacement of the arm in a plane normal to the row of core posts between a first position in which the arm is spaced inwardly from the side of the row of core posts adjacent the track, and a second position in which the arm is spaced outwardly from the opposite, outer side of the row of core posts, a motor driven timing belt is operatively associated with the wire laying head for effecting reciprocal movement along the track and control means are connected to the solenoid to reciprocally move the arm between the first position and the second position to weave wire around portions of said posts in a predetermined pattern to form a computer matrix.

3,639,966
VARIABLE CRIMPING ECCENTRIC PRESS
Herbert D. Scharf, 437 Merwyn Road, Merion, Pa.
Filed June 18, 1970, Ser. No. 47,405
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 D 3 Claims

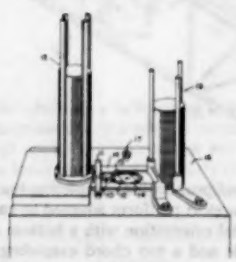


In a variable crimping eccentric press including a crankshaft for oscillating a rod that actuates a crimping die and wherein the crankshaft has a built-in eccentric throw, means to vary the eccentric throw of the crankshaft including a replaceable cylinder secured to the crankshaft at its connection to the rod whereby the cylinder is constructed to have a degree of eccentricity that will achieve a desired eccentric throw of the rod.

3,639,967
PIPE-JOINING MACHINE
Jack Edward Brighton, Hudson, Mich., assignor to B & B Pipul, Inc.
Filed May 26, 1969, Ser. No. 827,512
Int. Cl. B23p *19/04*
U.S. Cl. 29—237 8 Claims

The present invention is a pipe-joining machine for installing successive pipe units. The pipe-joining machine includes a longitudinally extending base assembly having a front plate, a rear plate spaced from the front plate and connecting bars joining the front and rear plates. A hydraulic cylinder, having a drive rod, is mounted and extends horizontally rearwardly from the rear plate. Control mechanism including a multipassage hydraulic valve is in communication with the hydraulic cylinder. A gripper mechanism is provided on the free end of the drive rod and is effective for releasably grasping a cable. One end of the cable is fed through successive ones of the pipe sections being installed and rearward movement of the hydraulic cylinder drive rod applies a pulling force to the last pipe section in the chain to properly seat the last pipe section with respect to the adjoining pipe section.

3,639,968
CLOSURE-ARRESTING DEVICE
Raymond E. Price, Belmont, and Clifford F. Tirrell, South Weymouth, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.
Filed Apr. 9, 1969, Ser. No. 814,645
Int. Cl. B23g *7/10*
U.S. Cl. 29—211 3 Claims



Holddowns which retain container closures such as can ends and maintain their proper alignment with rotating chucks of container closure-lining machines are made by suspending a narrow, bowed, leaf spring or wire above the path of travel of the closure through the machine and arranged to bear on the closure before it is stationed upon the chuck in a lining receiving position. It is preferred to arrange the spring so that pressure is applied on the closure substantially over the center of the closure.

3,639,969
METHOD AND DEVICE FOR MAKING AND FINISHING ZIP FASTENERS

Marcel Potin, Choisy-le-Roi, France, assignor to Societe Financiere Francoise De Licences Et Brevets, Choisy-le-Roi (Val de Marne), France

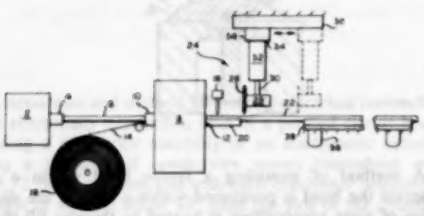
Filed Jan. 6, 1970, Ser. No. 912
Claims priority, application France, Jan. 8, 1969, 6900119
Int. Cl. B23p *11/00, 19/04;* B23k *1/06*
U.S. Cl. 29—408 6 Claims

Method of manufacturing and finishing a zip fastener from a section taken from a continuous chain comprising two rows of coupling members of synthetic material carried by a pair of parallel tapes. This method consists in causing a tool to be lowered upon the position contemplated for constituting the "closed" end of the zip fastener to be completed, said tool being vibrated at supersonic frequency and having its operative end formed on the one hand with a projecting ridge extending across the full width of the chain and on the other hand a central protrusion registering with the two rows of coupling members, said tool being so positioned and directed that said protrusion lies on the side of the fastener's section being finished. The device according to the present invention consists essentially of a tool as described hereinabove.

3,639,970
METHOD AND APPARATUS FOR FORMING PLASTIC-LINED METAL CONDUIT

Mark E. Larkin, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Oct. 2, 1969, Ser. No. 863,198
Int. Cl. B23p *17/00*
U.S. Cl. 29—411 3 Claims



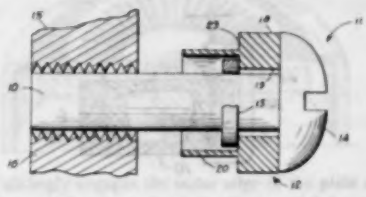
An apparatus for continuously forming a metal and plastic composite conduit having a metallic outer surface, cutting portions from the continuously formed conduit, and ejecting the cutoff portions from the apparatus.

3,639,971
METHOD OF PRODUCING A CAPTIVE JACKING SCREW

Bulent Gulistan, Malibu, Calif., assignor to Deutsch Fastener Corp., Los Angeles, Calif.

Original application Mar. 4, 1968, Ser. No. 710,294, now Patent No. 3,502,130, dated Mar. 24, 1970. Divided and this application Jan. 2, 1970, Ser. No. 163
Int. Cl. B23p *11/00*
U.S. Cl. 29—437 3 Claims

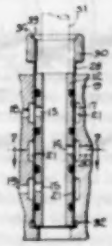
The method of providing a fastener for separating associated parts when the fastener is loosened in which the unthreaded shank of a screw blank is extended through a collar having an outwardly extending flange at one end and a thin-walled portion at the other end adapted to be bent outwardly in securing the collar to a workpiece, the collar also having an internal shoulder, after which a retainer ring is placed on the shank and is engageable with the internal shoulder, and threads are rolled on the end of the shank to hold the retainer ring on the shank.



3,639,972
METHOD OF FORMING A VALVE STRUCTURE WITH O-RING SEALS

Carl O. Schelin, and Arne L. Eisentraut, both of Rockford, Ill., assignors to Woodward Governor Company, Rockford, Ill.

Original application Nov. 27, 1968, Ser. No. 779,354, now Patent No. 3,547,158, dated Dec. 15, 1970. Divided and this application May 4, 1970, Ser. No. 34,115
Int. Cl. B23p *11/02*
U.S. Cl. 29—451 2 Claims



A sleeve having axially spaced external grooves and O-rings seated in the grooves form an assembly which is telescoped endwise into a bore to form seals from confining the flow of fluid through an intervening port in the bore and a hole in said sleeve. The sleeve and ring assembly is first inserted endwise into an imperforate tube smaller than the bore wall and larger than the sleeve so that, during the insertion of the tube and sleeve assembly, the O-ring is covered as it is moved past the edge of the port. After withdrawal of the tube from the bore, the O-ring is left unmarked with its original external surface contour expanded against bore wall.

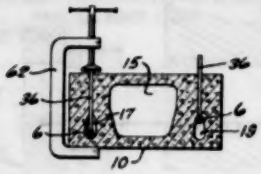
3,639,973
METHOD OF MAKING MULTIPLE TENDON, PRESTRESSED SEGMENTED CONCRETE BEAM

James M. Young, 3402 West Wells St., Milwaukee, Wis.

Original application Apr. 29, 1968, Ser. No. 724,980, now Patent No. 3,561,179, dated Feb. 9, 1971, which is a division of application Ser. No. 460,904, June 3, 1965, now Patent No. 3,407,554, dated Oct. 29, 1968. Divided and this application Mar. 6, 1970, Ser. No. 17,065
Int. Cl. B21d *39/00*
U.S. Cl. 29—452 5 Claims

A method of making a multiple tendon, prestressed segmented concrete beam includes the steps of locating and

stressing the tendons so as to produce equal compressive prestress laterally across the beam. The method eliminates



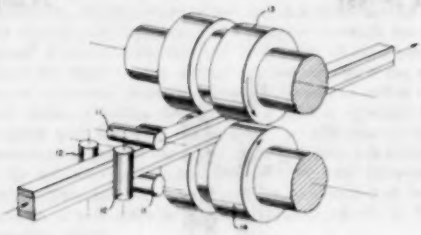
the vertical end splitting which has occurred during the manufacture of multiple tendon beams in the past.

3,639,974

ROLL BONDING AN ALUMINUM-FERROUS COMPOSITE WITH GROOVED ROLLS

Walter D. Finnegan, Concord, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Feb. 2, 1970, Ser. No. 7,776
Int. Cl. B23k 5/22, 31/02
U.S. Cl. 29—493 5 Claims



A method for forming long lengths of composite material suitable for the subsequent manufacture of transition inserts comprising assembling a ferrous element and an aluminum element, and, if necessary, an aluminous bonding element into a prebond sandwich, heating the sandwich to a temperature between 400° and 900° F. and subjecting the sandwich to a one-step thickness reduction by passing the sandwich through matching, rectangularly grooved rolls thereby forming a sound, solid phase metallurgical bond between the elements.

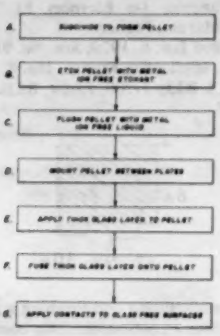
3,639,975

GLASS ENCAPSULATED SEMICONDUCTOR DEVICE FABRICATION PROCESS

Edward G. Tefft, Auburn, N.Y., assignor to General Electric Company

Filed July 30, 1969, Ser. No. 846,186
Int. Cl. B01j 17/00; H01l 5/00
U.S. Cl. 29—580 13 Claims

A silicon semiconductor device is manufactured by sandblasting a pellet from a wafer and etching the peripheral surface of the pellet formed by sandblasting with an essentially metal-ion-free acid in an environment also free of metal ions. The pellet is flushed after etching with deionized water and mounted between plates which expose only the peripheral surface. A thick glass layer is deposited on the peripheral surface of the pellet by electrophoresis and thereafter fired to form an impervious passivating and encapsulating layer tenaciously adhered to the pellet surface. Contacts are applied to form a completed device.

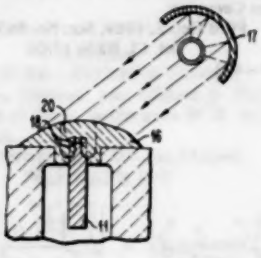


3,639,976

METHOD OF MOUNTING A FERRITE HEAD

Helen M. Hoogendoorn, Schenectady; Herbert E. Liberman; Bernt Narken, and Brian Sunners, all of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Original application Feb. 29, 1968, Ser. No. 709,457, now Patent No. 3,562,444. Divided and this application Aug. 3, 1970, Ser. No. 60,235
Int. Cl. G11b 5/42; H01l 7/06
U.S. Cl. 29—603 8 Claims



A method of mounting a ferrite head within a slider wherein the head is positioned within a slot on the slider, a mass of glass composition is heated to thereby fill the gap between the head and slider, machining the head while being held between solidified glass and subsequently heating a second mass of glass by infrared radiation to fill in the depression created by the machine operation.

3,639,977

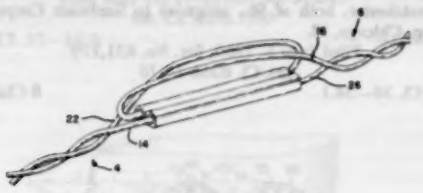
METHOD OF CONNECTING PAIRS OF WIRES

William Roderick Over, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Original application Feb. 1, 1967, Ser. No. 613,162, now Patent No. 3,444,312. Divided and this application Apr. 24, 1969, Ser. No. 820,700
Int. Cl. H01r 43/00; H02g 15/08
U.S. Cl. 29—628 1 Claim

Corresponding wires of two pairs of wires are connected to each other by single connectors having two electrically separate crimpable ferrules. A wire of each pair is positioned in a tool in a manner such that it extends axially into one ferrule. The remaining wire of each pair is positioned in the tool

in a manner such that it extends externally past the connector, is reversely bent, and extends into the other ferrule.

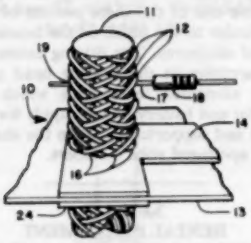


Upon actuation of the crimping tool, the end portions of the four wires are trimmed and the crimpable ferrules are crimped onto the wire ends.

3,639,978
METHOD FOR MAKING FLEXIBLE ELECTRICAL CONNECTIONS

Walter R. Schurman, Centerville, Ohio, assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 3, 1969, Ser. No. 873,222
Int. Cl. H01r *43/00*; H05k *43/00*
U.S. Cl. 29—628 **4 Claims**



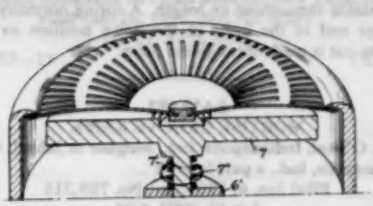
An apparatus and method for making electrical connection to an electrically conductive lead of a printed circuit board including a connector assembly of an elastomeric cylinder having a plurality of conductors woven thereabout with about 72 picks per inch and with each conductor oriented at an angle of at least about 30° from the axis of the cylinder, connection to the printed circuit board lead being effected by first stretching the elastomeric cylinder and associated mesh, inserting the stretched cylinder into a hole in the printed circuit board and lead, and releasing the cylinder to allow it to expand into and about the hole to press the plurality of conductors into electrical contact with the lead.

3,639,979
DRY-SHAVING APPARATUS

Frans Zaurveen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of application Ser. No. 670,506, Sept. 6, 1967, now abandoned. This application Sept. 17, 1969, Ser. No. 859,247
Int. Cl. B26b *19/16*
U.S. Cl. 30—43.6 **7 Claims**

This dry-shaving apparatus has a shear plate deflected into a partial toroidal shape, its surface being cooperatively engaged with a movable cutting member and having inner and outer opposing edges. A first restraining member engages and applies a torque to the inner edge while a second

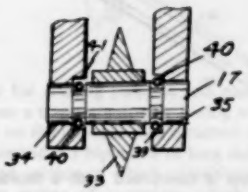


member slidingly engages the outer edge of the plate and resists the torque, thereby maintaining the toroidal shape.

3,639,980
PIPE CUTTER

George H. Muse, and Peter J. Keane, both of Erie, Pa., assignors to Erie Tool Works, Erie, Pa.

Filed Feb. 3, 1969, Ser. No. 795,878
Int. Cl. B23d *21/08*
U.S. Cl. 30—102 **1 Claim**

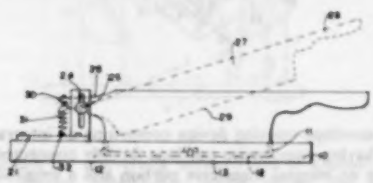


The pipe cutter disclosed herein is made up of a frame having a slide. The frame has a cutting wheel rotatably supported on it and two spaced noncutting wheels supported on the slide. Instead of the two noncutting wheels and one cutting wheel, three cutting wheels may be used or two noncutting wheels and a cutting means of some other form, or any combination of cutting or noncutting wheels. Also, some known cutting means could be used in combination with the noncutting wheels within the scope of the invention. A threaded means is provided to move the slide toward the cutting wheels. The cutting wheels are supported on pins and the pins each have a peripheral groove which receives an O-ring or a C-washer. The O-ring or C-washer is received in a space on the inner face of the guide blocks which receive the pin. The pin is thus held in position in the support by the O-ring or C-washer.

3,639,981
CUTTER FOR PIZZA PIES AND THE LIKE

Cecil Nowensky, 87 Coralberry Ave., Winnipeg, 17 Manitoba, Canada

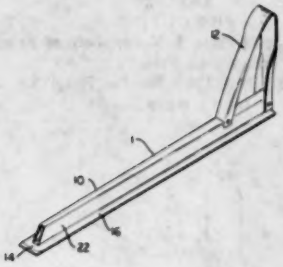
Filed Mar. 3, 1970, Ser. No. 16,032
Int. Cl. A47j *9/00*
U.S. Cl. 30—114 **1 Claim**



A turntable is mounted on a base to support the circular pizza pie or the like being cut. A knife is journaled by one

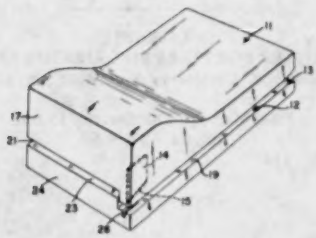
end thereof in a slotted support near the periphery of the turntable, the slots permitting the edge of the knife to engage the turntable throughout its length. A spring normally biases the inner end of the knife in the down position so that a complete cut is made through the pizza.

3,639,982
MORTISE GROOVE KNIFE
John E. O'Neal, Indianapolis, Ind., assignor to John J. Cotton, Indianapolis, Ind., a part interest
Filed Jan. 6, 1969, Ser. No. 789,315
Int. Cl. B26b *3/08*
U.S. Cl. 30—279 6 Claims



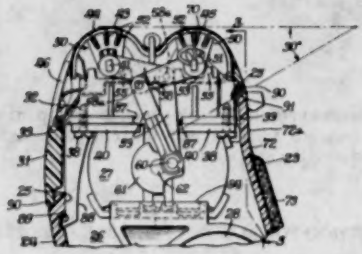
This invention is concerned with a mortise knife. More specifically, this invention is concerned with a mortise groove knife which is capable of cutting an elongated slot in porous materials which incorporate a skin. The knife of this invention generally comprises an elongated channel which is attached to a flat guide section wherein the width of said channel generally increases as the distance from the cutting edge increases.

3,639,983
ENVELOPE-OPENING DEVICES
Richard T. Knipfing, 8004 San Juan, N.E., Albuquerque, N. Mex.
Filed Jan. 13, 1970, Ser. No. 2,507
Int. Cl. B26b *29/00*
U.S. Cl. 30—294 5 Claims



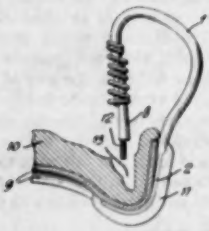
An envelope-opening device comprising an integral plastic body having coextensive portions flexibly connected at one end by an integral transverse portion and a longitudinal envelope receiving and guiding open side slot having opposite surfaces on the respective coextensive body portions, with a cutting blade projecting from one of the surfaces into the slot at the end of the slot opposite the hinge portion.

3,639,984
ELECTRIC DRY SHAVER WITH INCLINED SHAVING HEAD
Wilbur C. Jackson, Wheaton, and William P. Beck, Westchester, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed June 6, 1969, Ser. No. 831,179
Int. Cl. B26b *19/10*
U.S. Cl. 30—34.1 8 Claims



Electric dry shaver having a generally flat, rectangular housing with a shaving head extending the length of one of the edges of the housing and with the shaving head having a supporting frame which positions the shearing portion of the head in an inclined and displaced position with respect to the hand gripped portions of the housing. A long hair trimmer positioned at one end of the shear portion of the shaver extends perpendicular to the plane of the housing to facilitate the trimming of sideburns. The driving connection between the cutting assemblies in the shaving head and the shaver motor include elongated lever arms which overlap each other. The motor and battery power supply for the shaver are interconnected and supported between the shaving head and the housing by apertured yoke members.

3,639,985
DENTAL INSTRUMENT
Victor Pasko, 1053 North Winchester Ave, Chicago, Ill.
Filed Apr. 14, 1970, Ser. No. 3,835
Int. Cl. A61c *13/00*
U.S. Cl. 32—11 2 Claims



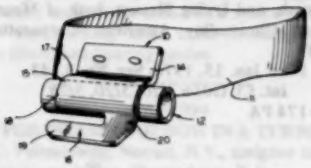
A dental instrument for use in a dental laboratory, particularly useful in making dental appliances. The dental instrument includes an elongated deformable rod which is manually deformed with facility. The elongated rod has a knurled flat mounting section on one end, particularly adapted for attachment to a mold tray, and a knurled flat holding portion on the other end. A coil spring is secured to the other end for holding releasably a dowel pin against the flat holding portion. The rod is manipulated to position the dowel pin in an appropriate location of a dental mold for making a dental appliance such as a wax model for a crown.

3,639,986

COMBINATION BUCCAL TUBE MOLAR PAD AND HOOK

Peter C. Kesling, Green Acres, La Porte, Ind.

Filed May 18, 1970, Ser. No. 38,045
Int. Cl. A61c 7/00
U.S. Cl. 32—14 A 8 Claims



A combination buccal tube molar pad and hook integrally formed, and including an attaching flange for attaching to a tooth band, a buccal tube mounting plate, and a hook arranged at the gingival side of the plate.

3,639,987

PANTY HOSE MEASURING APPARATUS AND METHOD

Howard M. Page, Elon College, N.C., assignor to Leath McCarthy & Maynard, Inc., Burlington, N.C.

Filed Apr. 28, 1969, Ser. No. 819,613
Int. Cl. A41h 1/00
U.S. Cl. 33—2 2 Claims

A panty hose measuring apparatus in which a pair of panty hose receiving forms are positioned parallel to each other for receiving the foot, leg, crotch and waist portions of a panty hose garment with the forms being displaceable in response to forces applied to the forms reflecting size and volume dimensions of the panty hose garment being tested. A method for testing volumes and sizes of panty hose garments having foot, leg, crotch and waist portions by placing the panty hose garment on a form to receive the panty hose garment portions, stretching the garment at least longitudinally and transversely, and applying a longitudinal force to stretch the garment to a prescribed extent and releasing the longitudinal force to a lower longitudinal force magnitude.

3,639,988

INSTRUMENT FOR ALTERING GARMENT PATTERNS

Leona Rocha Impastato, 315 East 86th St., New York, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,587
Int. Cl. A41h 3/00
U.S. Cl. 33—11 7 Claims

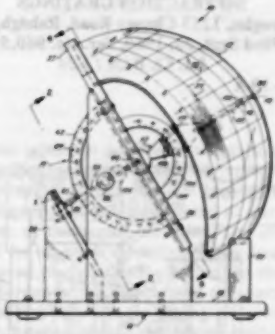
An instrument for altering patterns and making garment changes comprises a transparent ruler having on one side of straightedge and on the opposite side a curved edge one section of which constitutes a hip curve of long radius of curvature and a second section of which constitutes an armhole curve of shorter radius of curvature which curves over beyond a projection of the straightedge and then back to one extremity of the straightedge to provide a shape resembling the letter J. There are calibrated scales on both the straight and curved edges, a series of scaled lines parallel to the straightedge and also an elongate slot parallel to the straightedge.

3,639,989

COORDINATE CONVERSION CALCULATOR

William E. Rapstlber, 3621 McKibbon Road, St. John, Mo., and Richard G. Koenig, 5114 Hombert Road, Alton, Ill.

Filed Dec. 8, 1969, Ser. No. 883,186
Int. Cl. G01b 5/24
U.S. Cl. 33—1 SA 15 Claims



A calculator for converting between sets of azimuth and elevation angular coordinates which define the same direction but which are with respect to different planes, the planes being related to each other by pitch and roll angles therebetween. The calculator includes a gimbal assembly, an-

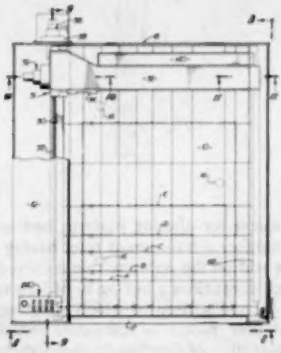
gular scales and cooperating pointers which form a mechanical analog of the direction, the planes, and the angles therebetween. When one set of angular coordinates and the pitch and roll angles between the planes are set into the calculator, the other set of angular coordinates is indicated thereby.

3,639,990

DRAFTING TABLE AND METHOD OF PRODUCING SAME

Andrew M. McInnis, Covina; Louis M. Ballard; Waldo I. Rogers, both of Arcadia; David C. Kramer, Redondo Beach, and Robert A. Nielsen, Pasadena, all of Calif., assignors to California Computer Products, Inc., Anaheim, Calif.

Filed Apr. 14, 1969, Ser. No. 815,697
Int. Cl. B43l *13/00*
U.S. Cl. 33—18 R **26 Claims**



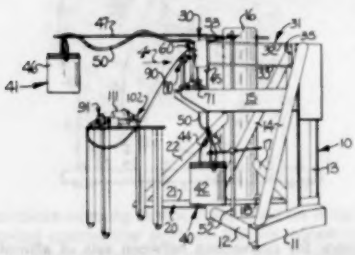
The disclosure concerns automatic drafting apparatus incorporating a drafting table in the form of a stone block with interior channels through which air is removable to apply suction to the underside of a worksheet placed on the table surface; the method of forming such channels in the block, with channel inserts; and provision for highly accurate driving and guiding over the table of a marking head supporting crossarm.

3,639,991

APPARATUS FOR AND METHOD OF MANUFACTURING DIFFRACTION GRATINGS

Robert A. Douglas, 1213 Chaney Road, Raleigh, N.C.

Filed Sept. 24, 1969, Ser. No. 860,551
Int. Cl. B43l *13/24*
U.S. Cl. 33—19 A **9 Claims**



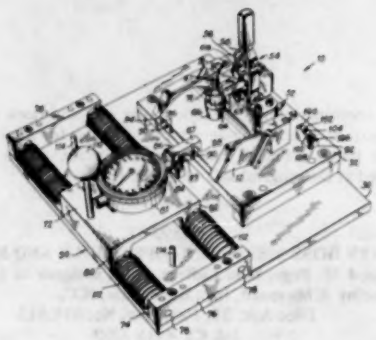
Apparatus for and method of manufacturing diffraction gratings wherein a series of parallel lines is impressed into a workpiece which is moved at a constant rate past a line-scribing means which is cyclically moved into contact with the workpiece in a predetermined time sequence correlated to the rate of movement of the workpiece and the desired number of lines per inch, and wherein both the workpiece and scribing means are mounted by flexible, resilient members for movement by flexure of the members.

3,639,992

CHORD LENGTH GAUGE

Charles Dabrush, and Irving Strauss, both of Monsey, N.Y., assignors to Chromalloy American Corporation, West Nyack, N.Y.

Filed Jan. 15, 1970, Ser. No. 3,143
Int. Cl. G01b *3/20, 5/20, 5/28*
U.S. Cl. 33—174 PA **6 Claims**



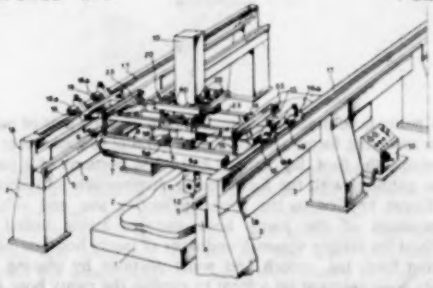
A measuring instrument to take a continuous reading of the variations in the chord lengths of airfoil vanes having an edge defined as a straight line. The instrument is adapted to determine whether the variations are within an acceptable range and readings are taken by a sliding dial gauge calibrated to indicate the acceptable range along an airfoil vane.

3,639,993

IMPROVEMENTS RELATING TO MACHINES AND APPARATUS HAVING A SUPPORT FOR GUIDING A MOVABLE MEMBER

Franco Sartorio, Turin, Italy, assignor to D.E.A. Digital Electronic Automation Societa per Azioni, Turin, Italy

Continuation-in-part of application Ser. No. 627,759, Apr. 3, 1967, now abandoned. This application Feb. 9, 1970, Ser. No. 9,778
Int. Cl. G01b *7/00, 7/04*
U.S. Cl. 33—174 **7 Claims**



A machine with a working head for operating on a large stationary workpiece, e.g., to measure it, has a longitudinal

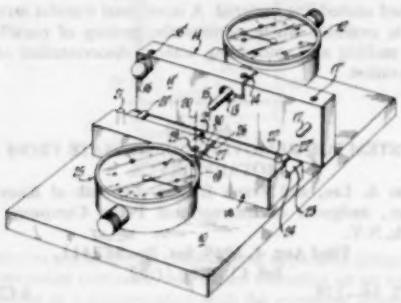
guide track along which a first bridge is slidable. A second bridge is slidable along a longitudinal load-bearing track parallel to the longitudinal guide track. A headstock carrying the working head is guided along a transverse guide track on the first bridge. A carriage is movable along a transverse load-bearing track on the second bridge, parallel to the transverse guide track. At least the greater part of the weight of the headstock is carried by the carriage on the second bridge, an extensible elastic suspension being connected between the headstock and carriage. The weight of the first bridge is carried at least predominantly by the second bridge through extensible elastic suspension units. This system allows high accuracy of the working head while avoiding the need for heavy precision load-bearing guides.

3,639,994

MEANS FOR MEASURING BOW IN A TURBINE BLADE

Edward C. Palmenberg, Nanuet, N.Y., assignor to Chromalloy American Corporation, Orangeburg, N.Y.

Filed Apr. 23, 1970, Ser. No. 31,286
Int. Cl. G01b *5/20*
U.S. Cl. 33—174 PA **27 Claims**



The invention contemplates a bow-measuring instrument in which simultaneous evaluation of the bow in a turbine vane is made at offset alignments, on both the convex and the concave surfaces of the airfoil section of the vane. The offsets are selected, for each type vane, so as to critically observe the extent of bow at or near the local regions at which these surfaces cooperate to define a nozzle throat, when vanes are assembled in side-by-side circumferential adjacency in a given gas-turbine stage; specifically, the "high point" in the center of the airfoil is observed for bow, at the center and along the alignment of the die-loading, in the hot-forming correction of vane shape. In this manner, a simple gaging operation helps to achieve greatly enhanced control of the uniformity and correct sizing of all nozzle-throat areas in a given stage of the turbine; and much better referencing is obtained for further gaging techniques.

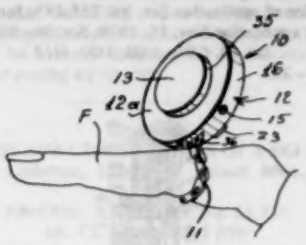
3,639,995

DEVICE FOR MEASURING THE RING SIZE OF A FINGER

Irving Gardner, Hunter, N.Y.

Filed Jan. 14, 1970, Ser. No. 2,885
Int. Cl. G01b *3/10*
U.S. Cl. 33—179 **7 Claims**

A device for measuring the size of a finger to determine the size of the ring that will fit the same. A disc is journaled in a casing formed of two parts. The disc carries a chain that is anchored on the exterior of the casing and on the disc within the casing so that the chain when pulled out of the casing is in the form of a loop through which a finger to be measured can be inserted. An arm carried on the disc has a pointed end exteriorly of the casing so that the size ring that will fit the finger is readily determined. When the chain links



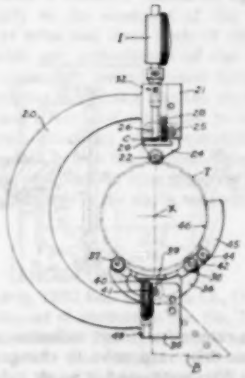
are not used for measuring they will readily retract into the casing by turning the disc.

3,639,996

SCREW THREAD GAGE WITH ALIGNER

Lowell C. Johnson, West Granby, Conn., assignor to The Johnson Gage Company, Bloomfield, Conn.

Filed Mar. 26, 1969, Ser. No. 810,562
Int. Cl. G01b *3/00*
U.S. Cl. 33—199 **16 Claims**



The invention relates to a screw thread gage having two or three thread-gaging elements, preferably rolls, and includes an aligner having an arcuate surface bearing screw thread means. The aligner is pivotally mounted at one end thereof adjacent to one of the gaging elements. The aligner assures that there will be no cross threading. For a test part having an external thread, the test part is laid in the threaded arcuate surface whereupon the aligner and test part are pivoted into gaging position between the gaging elements. For a test part having an internal thread the gaging elements are contracted and inserted in the test thread and the aligner is pivoted into engagement with the test thread whereupon the gaging elements are expanded into contact with the test thread with the aligner engaging the thread. The aligner may also serve as a part of a back stop in a two-element gage for retaining the test part in gaging position.

3,639,997

PENDULOUS RANGE FINDING DEVICE

Henry J. Koeber, Deerfield, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Continuation of application Ser. No. 735,293, June 7, 1968. This application Nov. 16, 1970, Ser. No. 90,142

Int. Cl. G01c *1/00, 3/00, 9/12*

U.S. Cl. 33—221 10 Claims

A range finding device using the principle of triangulation and having a pendulous member selectively adjustable in low-frictional engagement about a support axle and lockable in an adjusted position with an indicator relative an expanded scale.

3,639,998

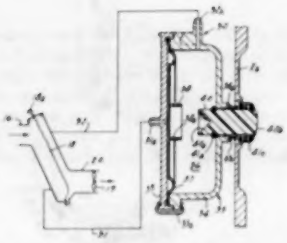
FILTER CONDITION INDICATOR

Anthony Mason, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 21, 1970, Ser. No. 39,455

Int. Cl. F26b *19/00*

U.S. Cl. 34—82 10 Claims



A pressure-responsive filter indicator assembly in a domestic clothes drier responsive to changes in a pressure drop across the filter positioned in an air exhaust passage to provide a continuously visible signal that is terminated only by manual reset operation. The indicator assembly includes a light-transmitting member and a diaphragm movable between two positions, with the light-transmitting member providing a visible signal on the control console of the drier when the diaphragm is in one position. The diaphragm is responsive to changes in the pressure drop across the filter to move to the position in which the light-transmitting rod provides a visible signal on the console.

3,639,999

APPARATUS FOR TISSUE PREPARATION

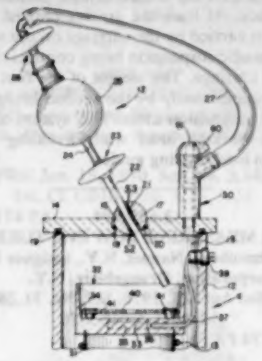
Robert P. Adams, Walden, N.Y., assignor to Cenco Medical/Health Supply Corporation, Chicago, Ill.

Filed Apr. 16, 1970, Ser. No. 29,128

Int. Cl. F26b *13/30*

U.S. Cl. 34—92 5 Claims

A tissue-embedding assembly is shown which is convertible to a resin option from a paraffin option. The tissue-embedding assembly permits the simultaneous embedding of multiple-tissue specimens with degassed embedding material. Full observation of the process as well as manipulation of the specimens is available during and up to solidification of the degassed embedding material. A novel heat transfer arrangement is available which permits the heating of paraffin to cause melting and embedding without disconnection of the refrigeration.



3,640,000

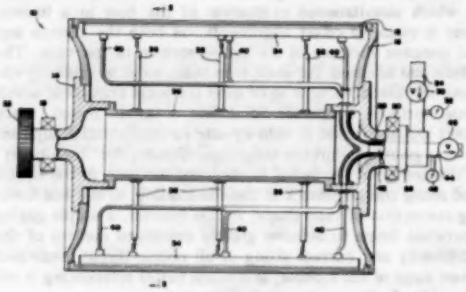
SYSTEM FOR REMOVING CONDENSATE FROM A ROTARY DRYER

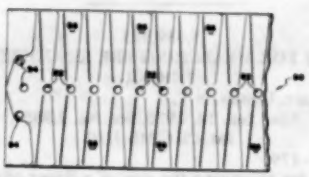
Charles A. Lee, and Frank D. Sorrells, both of Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.

Filed Aug. 4, 1969, Ser. No. 847,111

Int. Cl. F26g *11/02*

U.S. Cl. 34—125 8 Claims





Condensate rimming the inner surface of the shell of a rotary dryer is removed with steam exiting from the interior of

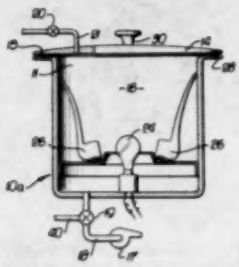
the shell through a plurality of orifices into an exhaust manifold within the shell, whence it is exhausted to the exterior of the shell. To assist in removal of the condensate, a plate attached to the manifold forms a plurality of flow channels substantially parallel to the surface of the condensate. The cross-sectional area of the flow channels decreases in the direction of flow of the steam so that steam driven from the interior of the shell is accelerated along the surface of the condensate over a substantial distance to shear water from the inner surface of the shell and entrain the water in the steam as the steam passes through the orifices into the manifold.

3,640,001

TOBACCO SMOKING PIPE CONDITIONING APPARATUS

John M. Ellison, 4907 Ethyl Ave., Sherman Oaks, Calif.

Filed Aug. 17, 1970, Ser. No. 64,335
Int. Cl. F26b *25/16*
U.S. Cl. 34—218 **1 Claim**



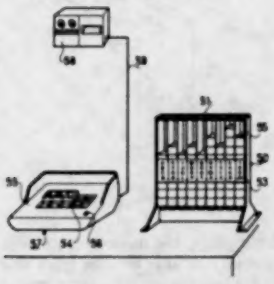
Tobacco smoking pipe conditioning apparatus comprises a pipe-receiving container, and means including an air evacuation pump in communication with the container interior for reducing air pressure in the container to a level at which smoking deposits on the pipe are vaporized and withdrawn from the container interior.

3,640,002

MAN-TO-MACHINE PERIPHERAL COMMUNICATION DEVICE

Pierre L. Braillard, Saint-Cloud; Jean-Louis Moreuil, and Marius Steru, both of Paris, all of France, assignors to Compagnie Generale D'Electronique Industrielle Lepaute CGEI-Lepaute, Paris, France

Filed June 22, 1970, Ser. No. 48,346
Claims priority, application France, June 23, 1969, 6921005
Int. Cl. G09b *1/06*
U.S. Cl. 35—8 R **10 Claims**



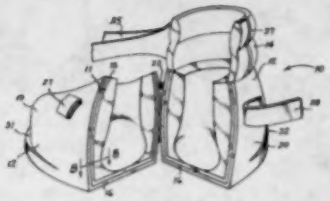
A man-to-machine peripheral communication device comprising a matrix having a number of matrix positions, a plurality of character supports each of which may be inserted in one of said positions, and interconnection means between said support and matrix for translating the character or characters borne by said supports into coded electrical signals. The said translating means may be electromechanical, electromagnetic, electrostatic or optical. The coded signal may be visually displayed or transmitted to data processing or storing equipment.

3,640,003

METHOD AND CONSTRUCTION OF A SKI BOOT

Roland M. Anderson, 1616 S.W. Sunset Blvd., Portland, Oreg.

Filed Mar. 2, 1970, Ser. No. 15,375
Int. Cl. A43b ; A43d *9/00*
U.S. Cl. 36—2.5 AL **14 Claims**



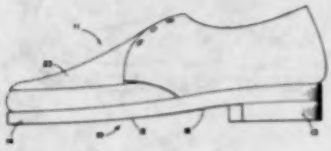
Footwear, such as a ski boot, include interfitting inner and outer shells. The shells are divided into corresponding toe and heel sections, hinged together for coordinate opening to permit foot entry from the rear of the boot. The inner shells are fabricated with a resilient, custom-fit lining formed to conform precisely to the contours of the wearer's foot. Removable inner soles and inner heels of adjustable height are provided with one embodiment of the inner shell. In fabricating the custom-fit shells, a liquid lining composition of uncured elastomer is injected into the shells, filling voids around the wearer's feet; and permitted to cure before the feet are removed. Stockings of polyethylene film can be placed over the feet before the custom-fitting operation to prevent the lining composition from adhering to the feet and to permit easy separation of the shells, when finished.

3,640,004

SHOE CONSTRUCTION

William E. Haselrig, 1802 East Granada Ct., Ontario, Calif.

Continuation-in-part of application Ser. No. 752,000, Aug. 12, 1968, now abandoned. This application Oct. 7, 1969, Ser. No. 871,471
Int. Cl. A43b *13/36*
U.S. Cl. 36—15 **14 Claims**



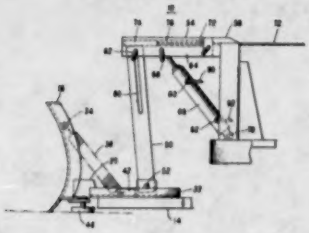
A shoe that includes an upper section and a lower section, the lower section having a forward peripheral recess that receives a projecting flange at the bottom edge of the upper section securing the parts together at that location while prongs projecting forwardly from the lower portion of the upper section are received in recesses in the lower section and provide stability against lateral shifting of the two sec-

tions. Sealed fasteners at the rearward portion of the shoe extend between the upper and lower sections, securing them together.

3,640,005
SELECTIVELY LOCKABLE FLOATING SNOWPLOW MOUNT

Generoso Chiarolanza, 127 Park Ave., and Joseph Chiarolanza, 149 Park Ave., both of Madison, N.J.

Filed Mar. 25, 1970, Ser. No. 22,584
Int. Cl. E01h 5/06
U.S. Cl. 37—42 R 13 Claims

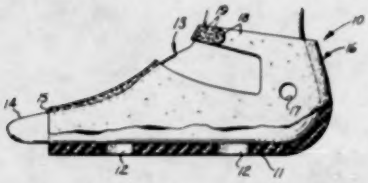


A plow adapter for use in conjunction with a vehicle allows the plow to be alternately used in two modes of operation: floating or rigid. The adapter comprises illustratively first and second members each having one end pivotally connected, respectively, to the plow frame and the vehicle frame, the other ends of the members are slidably engaged to permit floating operation in which the plow follows the contours of the road surface. In addition, one of the members is provided with a releasable locking member which can be adapted to fix the relative positions of the first and second members with respect to one another, thereby permitting rigid operation in which downward pressure exerted through the adapter forces the plow against the road surface for such operations as scraping.

3,640,006
FOOT GUARD

Zola F. Kendrick, Box 93, Devine, Tex.

Filed Apr. 27, 1970, Ser. No. 32,010
Int. Cl. A43b 5/08
U.S. Cl. 36—8.1 4 Claims



A foam rubber device to be worn on the feet. This device is constructed of a continuous piece of foam rubber and includes velcro fasteners on the straps which secure it to the foot of the wearer. The device also has a flat sole portion having openings for ventilation, the side portions of the main body also having an opening for ventilation around the ankle area and the forward end of the main body is open so that the toes of the wearer may extend outward.

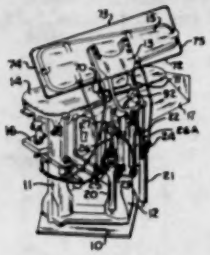
ERRATUM

For Class 37—42 see:
Patent No. 3,640,005

3,640,007
FLUID-OPERATED MACHINE AND SAFETY CONTROL SYSTEM THEREFOR

Frank H. Richterkessing, 1200 Park Hills Drive, Louisville, Ky.

Filed May 12, 1969, Ser. No. 823,722
Int. Cl. D06f 71/00
U.S. Cl. 38—41 7 Claims



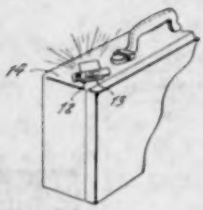
A fluid-operated machine having members for applying pressure to a workpiece placed therebetween by an operator, which machine is equipped with safety controls to prevent trapping of the hands of the machine operator, or of another person, between the members during closing of the same upon the workpiece.

A garment-pressing machine employing a valve-controlled conduit system with the safety controls included, and without detracting from the numerous operating capabilities required of a garment pressing machine, is employed to illustrate the invention.

3,640,008
LUGGAGE SPOTTER

Gordon C. Crail, 91-1311 Imelda St., Ewa Oahu, Hawaii

Filed Feb. 25, 1970, Ser. No. 14,121
Int. Cl. A44c 3/00
U.S. Cl. 40—2 R 2 Claims



A label for luggage, the device comprising a flat card having adhesive on a rear side and the front side being provided with space for a luggage owner's name and address, a portion of the front side being colored with iridescent paint so that the luggage can be easily spotted.

3,640,009

IDENTIFICATION CARDS

Eizo Komiyama, 510, 1-chome Nakayama-cho, Ichikawa-shi, Chiba-ken, Japan

Filed Sept. 9, 1969, Ser. No. 856,286
Claims priority, application Japan, June 7, 1969, 44/53401
Int. Cl. G09f 3/20
U.S. Cl. 40—2.2 1 Claim

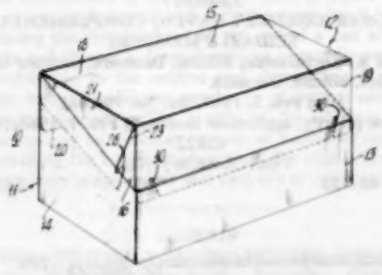
An identification system utilizing an identification card which has thereon identifying indicia which is invisible under normal, visible light. The card or other article of identification includes a portion formed with an opening receiving a sheet on which identifying indicia is located, and this identifying indicia includes at least a portrait of the individual who is authorized to use the identification article. The sheet can also carry a signature of this individual, and the nature of the indicia is such that it can be rendered visible by making use of light beyond the visible spectrum, such as ultraviolet light or infrared light, with a suitable filter being located over the sheet with the indicia thereon so as to permit only the desired light to reach the indicia.

3,640,010

DISPLAY DEVICE

Murray Altman, Valley Stream; Mordecai R. Craig, Demarest, and Irwin H. Block, New York, all of N.Y., assignors to The Purdue Frederick Company

Filed Feb. 16, 1970, Ser. No. 11,627
Int. Cl. G09f 1/00
U.S. Cl. 40—124.1 7 Claims



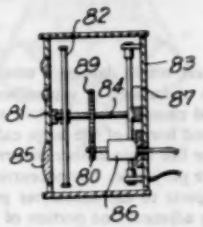
A carton cover which may be converted to an upright display panel comprises an information bearing rectangular top panel, and depending sideflaps having rearwardly downwardly inclined front edges, a relatively deep rectangular front flap and a relatively shallow rectangular rear flap, the flaps being delineated from the panel by fold lines. Upwardly outwardly inclined slots are formed in the front panel bottom edge proximate the corners thereof. Coupling tabs include upwardly projecting tongues along the lower front edges of the sideflaps and are spaced therefrom and connected thereto by integrally formed bridge sections. As an erected display the coupling tabs engage the slot, the tongues functioning as rear feet, and the panel is supported along its front edge in an upwardly rearwardly inclined position.

3,640,011

FLOWING-LIGHT DEVICES

Minoru Fukumitsu, Central P.O. Box 327, Tokyo, Japan

Continuation of application Ser. No. 681,434, Nov. 8, 1967, now abandoned. This application Sept. 14, 1970, Ser. No. 72,144
Int. Cl. G09f 13/06
U.S. Cl. 40—133 A 5 Claims



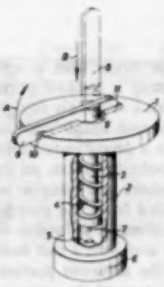
A cylindrical lenslike element is used with a multiple color light source to provide a flowing color effect. The source may be a lamp or reflected light. Mobile colored film may be used with the light source. The invention can be embodied in an advertising device, a lamp, etc. A day-night switching arrangement is also provided.

3,640,012

FIRING MECHANISM FOR A PYROTECHNIC DEVICE

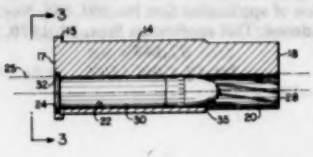
Alfred James Schermuly, Windswept Kingsdown, near Deal, Kent, England

Filed Mar. 27, 1970, Ser. No. 23,338
Claims priority, application Great Britain, Mar. 31, 1969, 16,683/69
Int. Cl. F41c 19/00
U.S. Cl. 42—1 R 5 Claims



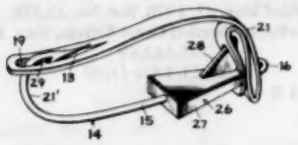
An improved mechanical firing mechanism of the kind in which a spring-urged striker pin is employed for detonating a percussion igniter in a pyrotechnic device. The mechanism comprises a manually actuated lever pivotally attached to the striker pin and employed to prime a striker spring in a first part of its movement and to release the primed striker pin when the lever is aligned with the striker pin.

3,640,013
SUBCALIBER ADAPTER FOR FIREARM
Clarence W. Franklin, Cedar Tree Farm, Milford, Calif.
Filed May 5, 1969, Ser. No. 821,616
Int. Cl. F41c *21/10, 21/12*
U.S. Cl. 42—77 12 Claims



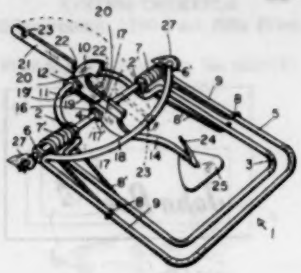
A chamber insert which defines a small caliber chamber through which an undersized or subcaliber projectile can be fired. The defined chamber is eccentric with respect to the larger chamber and barrel of the large caliber firearm so as to enable a center fire large caliber firearm to fire a smaller rim fire subcaliber projectile. The eccentricity of the defined chamber also imparts to the subcaliber projectile an initial trajectory passing adjacent one portion of the oversized barrel wall for guiding the projectile along its intended path. Provision is made for the simultaneous firing of a plurality of subcaliber projectile from a single insert within the oversized chamber and barrel.

3,640,014
FISHHOOK WITH WEED GUARD
Philip W. Gurka, 180 Bellevue Ave., Upper Montclair, N.J.
Filed Apr. 30, 1970, Ser. No. 33,406
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.43 8 Claims



A fish lure and/or hook with a self-locking detachable weed guard comprising a hooked portion terminating in a barbed point and with a relatively straight shank, an enlarged portion mounted on said shank and providing a transverse abutment formed on a prong outstanding from the shank in the plane of said hooked portion, an eye carried by one of said associated members and lying so as to provide a transverse abutment spaced from the prong, a weed guard comprising a one-piece elongated flexible normally flat strip attached to the shank and with a slot near one end for receiving said point and the adjacent portion of the bend of the hook as they curve toward the strip, said strip being bent over on itself, with the bend of said hook adjacent said point passing through said slot, the strip normally engaging and exerting shielding force on the inner side of the barbed point from the shank, said strip being stabilized with respect to the hook by having a series of elongated slots to receive the eye while folded to aperture-registry and pushed on, the folded portion being then given a quarter turn to resiliently lock between the eye and the adjacent surface of the abutment with said prong fitting a slot in the folded portion of said guard to prevent unintentional removal thereof.

3,640,015
HUMANE ANIMAL TRAPS
Arthur Miller Fisher, Box 253, Slave Lake, Alberta, Canada
Filed Sept. 23, 1969, Ser. No. 869,993
Int. Cl. A01m *23/26*
U.S. Cl. 43—83.5 1 Claim

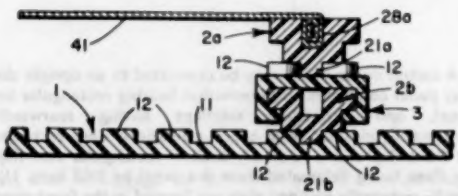


A pair of jaws are pivotally mounted on a common shaft and have springs for biasing the jaws from an open to a closed position. A trigger is pivotally connected to an offset portion of one jaw and has a latch portion adapted to engage an offset portion of the other jaw for holding the jaws in open position. A bait holder is pivotally connected to the jaw shaft and has a portion disposed on each side of the shaft for contact with an extended arm of the trigger.

3,640,016
DESULFURIZATION OF COAL
Bernard Shing-shu Lee, Lincolnwood, and Frank C. Schora, Jr., Palatine, both of Ill., assignors to Institute of Gas Technology
Continuation-in-part of application Ser. No. 579,923, Sept. 16, 1966, now abandoned. This application Mar. 28, 1969, Ser. No. 811,654
Int. Cl. C10l *5/00*
U.S. Cl. 44—1 7 Claims

A method for desulfurizing coal by reacting sulfur-containing bituminous coal with hydrogen in the presence of a hydrogen sulfide "getter" at a temperature about 600–800° F.

3,640,017
SLIDE-BAR ASSEMBLY HAVING COMPLEMENTARY SLIDABLE MEMBERS
Godtfred K. Christiansen, Billund, Denmark, assignor to A/S Modulex, Billund, Denmark
Filed Feb. 3, 1969, Ser. No. 796,065
Claims priority, application Denmark, Feb. 1, 1968, NR 42822
Int. Cl. A63h *33/06*
U.S. Cl. 46—23 2 Claims



A slide-bar assembly including an elongated hollow female member of substantially rectangular cross section and a slot

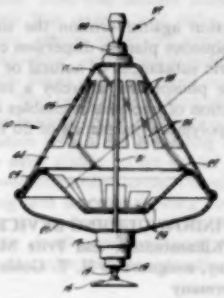
extending longitudinally along one face and two rows of coupling studs extending outwardly of the opposite face, and an elongated male member adapted for slideable mounting within the female member and provided on one face thereof with a longitudinal rib adapted to protrude outwardly of the slot in the female member when so mounted.

3,640,018
KNOCKDOWN STRUCTURAL TOYS
Stanley Light, 21 Beverly Road, Douglaston, N.Y.
Filed May 18, 1970, Ser. No. 38,112
Int. Cl. A66h *33/10*
U.S. Cl. 46—29 **17 Claims**

A modular structural toy constituted by comparatively few basic elements with which may be combined a virtually limitless number of cylindrical members, such as waste beverage cans, for the assembly of all types of structures striking the imagination of a child or an adult. A cubical block is fitted with annular resilient retainers, preferably of flexible plastic material, on five faces thereof, wherefrom may be branched selectively in one or more desired directions, a plurality of the cylindrical members which are integrated at the juxtaposed ends by annular connectors having resilient lips which encompass the annular beads at the ends of the cylindrical members. A cylindrical projection extends from at least one face of the central block which is shaped with an annular bead resembling that on a can so that the block may be coupled closely adjacent to another block by one of the annular resilient retainers on the latter, or by one end of an annular connector. In order to compensate for differences in length of the cylindrical members or cans which may be used in the setting up of a structural assembly, annular adapters may be interspersed in the assembly, each of which may be fitted on one end thereof with a resilient annular lip for encompassing the circular bead at the end of a can while the opposite end thereof is formed with an outwardly extending rib conforming to the outline and dimension of a bead, whereby it may receive the annular lip of another adapter or an annular connector. The lengths of the adapters and/or connectors may be varied to provide an additional capability of controlling the composite length of the cylindrical structural members integrated by said adapters or connectors.

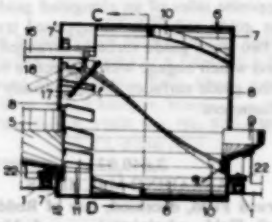
3,640,019
TOY TOP UTILIZING A MOVING PICUTRE APPARATUS
Lawrence Temple Jones, Pacific Palisades; Gerald W. Schmidt, Woodland Hills, and Jay Smith, III, Pacific Palisades, all of Calif., assignors to California R & D Center, Pacific Palisades, Los Angeles, Calif.
Filed Feb. 9, 1970, Ser. No. 9,891
Int. Cl. A63h *1/22*
U.S. Cl. 46—49 **8 Claims**

A toy top is disclosed having a main body member rotatable about its base. Conventional screw drive means are threadedly engageable with the main body member to impart a rotary motion to the top upon reciprocation of the screw. The main body member includes a plate mounted for rotation about the base having a graphic surface of sequential pictures peripherally mounted thereon. The body member further includes a transparent dome located over the graphic surface and rotatable therewith having a plurality of dark surfaces intermittently spaced about the periphery thereof. The intermittent spaces form viewing slots and are oriented in



such a manner that the line of sight of the operator to the graphic surface extends through the viewing slots. Upon revolving the top, the sequential pictures thereon when viewed through the slots, give the illusion of natural and continuous movement.

3,640,020
PLANT POTTING MACHINE
Franz Laible, 7761 Guettingen Kr., Konstanz/Bodensee, Germany
Filed July 30, 1970, Ser. No.
Claims priority, application Germany, Feb. 12, 1970, P 20 06 242.4
Int. Cl. A01g *9/08*
U.S. Cl. 47—1 **18 Claims**



This invention relates to a machine for the potting of plants, for example, for the potting of flower seedlings and the like, the plants being inserted into a cavity which can be formed by means of a conically shaped planting ram, a rotatable carrier being positioned to carry a plurality of plant pots and intermittently move the pots into a container charged with earth and which is rotated to move the earth over the pots, to be dropped therein for filling thereof.

3,640,021

METHOD FOR THE CONSOLIDATION OF SOIL

Fritz Grafmuller, Frankfurt am Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Aug. 15, 1969, Ser. No. 850,635
Claims priority, application Germany, Aug. 31, 1968, P 17 92 422.0
Int. Cl. A01g 7/00
U.S. Cl. 47—9 9 Claims

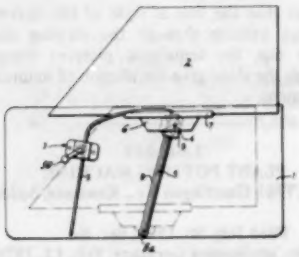
For the protection against erosion the surface of soil is sprayed with an aqueous plastics dispersion containing water insoluble polymeric substances of natural or synthetic origin and water-soluble phosphates whereby a coherent crust is formed. The addition of phosphates enables dispersions having a content of polymeric substance of 20 to 70 percent to be used.

3,640,022

WINDOW-GUIDING DEVICE

Herbert Kouth, Kilianstadten, and Fritz Marr, Offenbach, both of Germany, assignors to H. T. Golde GmbH, Frankfurt (Main), Germany

Filed Oct. 29, 1969, Ser. No. 872,041
Int. Cl. E05f 11/38
U.S. Cl. 49—420 10 Claims



A window-guiding device particularly for an automobile window includes a guide tube which is adapted to be raised and lowered by a driving handle and which is secured to a carriage. The carriage carries a member which is engaged with the lower edge of the window and the carriage is provided with a plurality of guide rolls which are guided on respective opposite sides of an elongated guide rail or track member. The guide rail includes opposed track sides each with at least two track guide surfaces arranged at an angle to each other and which engage with respective rollers. The rollers engage the guide surfaces simultaneously with equal effective roll diameters.

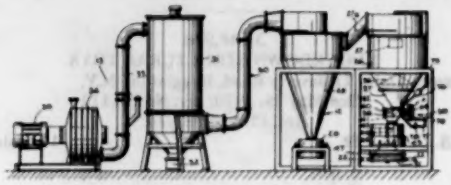
3,640,023

ABRADING MACHINES

Anthony Gerard Field, deceased, late of Redditch, England; Denis Cyril Field, administrator, and Madeleine Helen Field, administrator, both of Malvern, England, assignors to Abrasive Development Limited, Henley in Arden, Solihull, Warwickshire, England

Filed Aug. 19, 1969, Ser. No. 852,155
Int. Cl. B24c 3/04
U.S. Cl. 51—8 7 Claims

This application discloses a machine for abrading a workpiece with a blast of abrasive in which the reusable abrasive and detritus are removed by suction from the workpiece and the reusable abrasive is returned for redirection at the workpiece through the airlock arrangement of three hoppers, the middle one of which has its pressure changed periodically. The pressure changes in the middle hopper are effected automatically and cyclically by a diaphragm connected to a source of suction so that the suction forces gradually build up on one face of the diaphragm while the pressure in the middle hopper is at one value, then the diaphragm moves in response to said forces and thus changes the pressure in the hopper to another value and then the diaphragm returns to its initial position and the suction forces gradually build up again to commence another cycle.

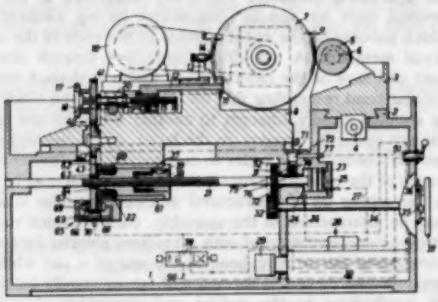


3,640,024

DEVICE FOR ADJUSTING THE POSITION OF A GRINDING WHEEL RELATIVE TO A WORKPIECE

Georg Stahn, Berlin, Germany, assignor to Firma Herbert Lindner GmbH, Berlin, Germany

Filed Jan. 20, 1970, Ser. No. 4,222
Claims priority, application Germany, Apr. 10, 1969, P 19 18 784.9
Int. Cl. B24b 49/18
U.S. Cl. 51—165.87 10 Claims



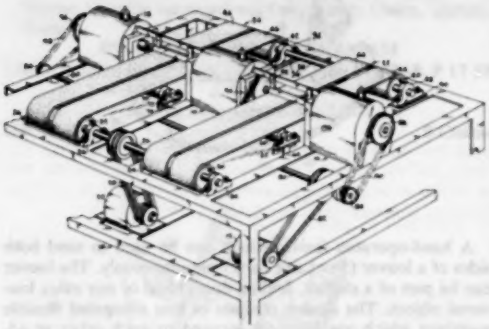
A device for adjusting the position of a grinding wheel relative to a workpiece in order to automatically compensate for the change in diameter in the grinding wheel during the trimming thereof by a trimming tool includes a gear connection between a trim spindle which is engageable with a nut on a trim carriage for shifting a trimming tool relative to the grinding wheel and to an adjusting spindle which is threaded into an adjusting nut carried on the grinding wheel carriage. The construction includes braking means for holding the gearing and the associated adjusting nut during the times at which the adjusting spindle is rotated for shifting the carriage, for example, by actuation of a hand wheel. The brake may be released during the time at which the trim spindle is rotated to shift the trim carriage in order to dress the surface of the grinding wheel and during this time the adjusting spindle will rotate relative to the adjusting nut so that the position of the adjusting nut with the carriage will be shifted in respect to the spindle by an amount corresponding to the movement of the dressing tool during the dressing operation.

3,640,025

WORKPIECE ADVANCING MEANS

Lucius P. Arnold, deceased, late of Hogansville, Ga.; L. P. Arnold, and Evelyn S. Arnold, heirs, assignors to J. E. (Johnnie) Williamson, Hogansville, Ga.

Filed June 15, 1970, Ser. No. 46,112
Int. Cl. B24b 21/02
U.S. Cl. 51—215 AR 12 Claims



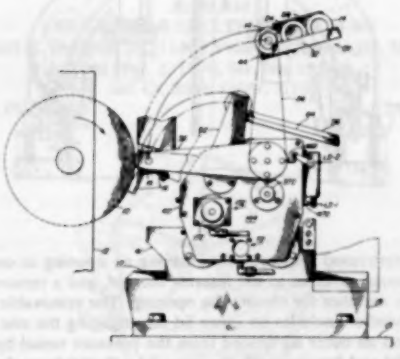
This invention relates to a cylindrical workpiece sanding machine which includes a plurality of workpiece driving heads for advancing a piece to be sanded through a sanding operation. Each of the workpiece driving heads includes a pair of shaped rollers biased into engagement with the workpiece, a drive train for rotating the rollers about a respective roller axis to advance the workpiece along its axis and for simultaneously rotating the rollers about the workpiece axis thereby spirally advancing the workpiece. A plurality of abrading belts are located on the sanding machine with means for driving an abrading surface on each of the belts adjacent the workpiece advancing axis.

3,640,026

WORKPIECE TRANSFER MECHANISM FOR CENTERLESS GRINDER OR THE LIKE

Richard J. Flanigan, Longmeadow, Mass., assignor to Gulf & Western Precision Engineering Company, Manchester, Conn.

Filed May 22, 1970, Ser. No. 39,802
Int. Cl. B24b 5/32
U.S. Cl. 51—215 R 22 Claims



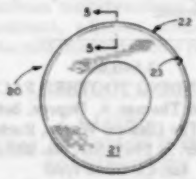
A mechanism for sequentially transferring annular workpieces to and from the work station of a centerless grinder and including a frame mounted for limited sliding movement parallel to the axis of rotation of a workpiece located at the work station, a workpiece loading arm pivotally mounted in the frame for rotational movement in a plane perpendicular to the direction of movement of the frame and between angular limits defined by the work station and a load station, and a workpiece unloading arm pivotally mounted in the frame for rotational movement in substantially the same plane between angular limits defined by the work station and an unload station. First and second crank arms have pin members thereon that engage and drive first and second geneva quadrants, which quadrants respectively drive the loading and unloading arms intermittently between their respective angular limits and with dwell intervals at each associated station. The oscillating motion of these arms is so timed that as the loading arm is moved from the load station to the work station it lags the unloading arm as the latter moves from the work station to the unload station. The sliding frame is moved forwardly during a dwell overlap interval when the loading arm is at the loading station and the unloading arm is at the work station and said frame moves rearwardly during the dwell overlap interval when the loading arm is at the work station and the unloading arm is at the unload station.

3,640,027

ANNULAR CUTTING BLADES

Shirley I. Weiss, deceased, late of Ramsey, N.J. (by Joel M. Albert, executor), assignor to Sel-Rex Corporation

Filed July 25, 1969, Ser. No. 844,904
Int. Cl. B24d 5/00, 7/00
U.S. Cl. 51—206 2 Claims



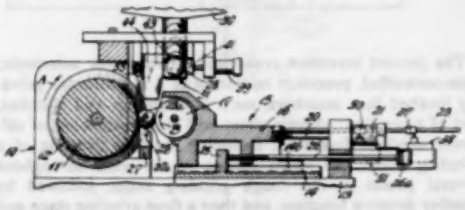
Annular cutting blades having thin metal cores carrying annular cutting portions comprising abrasive particles such as diamond dust and a metallic matrix in which the particles are embedded; the matrix being of metal or metal alloys of selected hardness.

3,640,028

METHOD OF REMOVING MOLDING FLASH AND THE LIKE FROM THE SURFACE OF GOLF BALLS

Henry P. Richard, South Hadley Falls, Mass., assignor to A.G. Spalding & Bros. Inc., Chicopee, Mass.

Filed July 9, 1969, Ser. No. 840,438
Int. Cl. B24b 1/00
U.S. Cl. 51—289 S 5 Claims



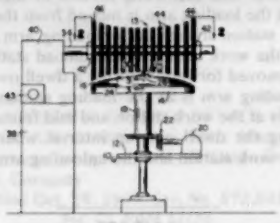
The method of automatically removing molding flash and the like undesired material from golf balls having a molded

outer surface provided with the usual dimples or depressions by a circumferential grinding operation and without damaging or interfering with the dimples.

3,640,029
METHOD OF BUFFING A METAL PERCUSSION INSTRUMENT

Robert Zildjian, Norwell, Mass., assignor to Avedis Zildjian Avedis Company, North Quincy, Mass.

Filed Feb. 16, 1970, Ser. No. 11,673
Int. Cl. B24b *1/00*; B24d *13/08*
U.S. Cl. 51—322 **5 Claims**

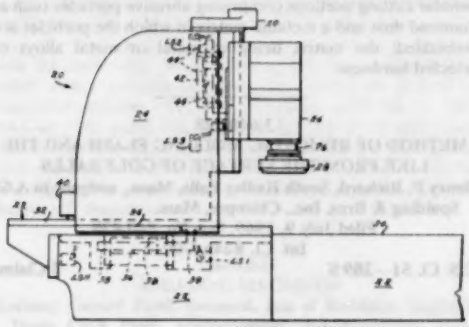


A buffed metal cymbal or the like percussion instrument is produced by a method in which a surface of the instrument is pressed against a deformable buffing surface moving at high speed at a pressure and for a time period sufficient to produce a shiny buffed finish but insufficient to raise the temperature of the metal enough or to remove sufficient metal to impair the prebuffed tonal quality or resistance to fracture of the instrument.

3,640,030
METHOD FOR GRINDING TOOTHED FACED MEMBERS

James F. Clarke, and Thomas A. Deprez, both of Rochester, N.Y., assignors to The Gleason Works, Rochester, N.Y.

Filed Mar. 3, 1969, Ser. No. 803,683
Int. Cl. B24b *1/00*
U.S. Cl. 51—325 **22 Claims**

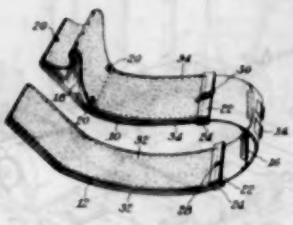


The present invention comprises provision for automatic, tape-controlled, precision operation of a machine for grinding toothed face members, such as couplings and clutches, and of large size, wherein there will be a succession of different machine functions, including periodic dressing of a grinding wheel and rough cutting of the work throughout several passes in the rough grinding stage, followed by another dressing function, and then a float grinding stage and subsequently a finish grinding stage utilizing, a corrective index system for precisely intermittently indexing the workpiece through equal, predetermined angular distances.

3,640,031
LOUVER DOOR SANDER

Mark Descant, 3617 1/2 Iberville St., New Orleans, La.

Filed Jan. 15, 1969, Ser. No. 791,451
Int. Cl. B24b *1/00*; B24d *11/00*
U.S. Cl. 51—391 **4 Claims**

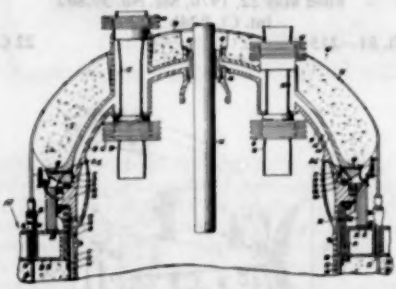


A hand-operated sander which can be used to sand both sides of a louver (front and back) simultaneously. The louver can be part of a shutter, folding door, blind or any other louvered object. The sander consists of two elongated flexible members which are hingedly secured to each other at adjacent ends. Each member is adapted to detachably receive sandpaper. In use, one sandpaper carrying member is used in sanding one side of the louver while at the same time the other sandpaper carrying member is used in sanding the other side of the louver. A louver edge sander can be incorporated into the remainder of the structure described above whereby the edge as well as both sides of the louver can be sanded at the same time.

3,640,032
PRESSURE VESSELS

Albert Jubb, Kenilworth, England, assignor to Rolls Royce Limited, Derby, England

Filed July 17, 1969, Ser. No. 842,580
Claims priority, application Great Britain, July 17, 1968, 33,976/68
Int. Cl. E04h *7/20*; G21c *13/08*
U.S. Cl. 52—2 **10 Claims**



A prestressed pressure vessel having an opening in one of its external surfaces to the interior thereof, and a removable closure member for closing the opening. The removable closure member includes an inner lid for engaging the one surface and an outer lid spaced from the pressure vessel by the inner lid and forming with the inner lid a fluidtight enclosure therebetween in which fluid under pressure can be supplied so as to move the inner and outer lids relative one another. At least one securing cable extends over the outer lid and is connected to the vessel at at least two points, and when fluid

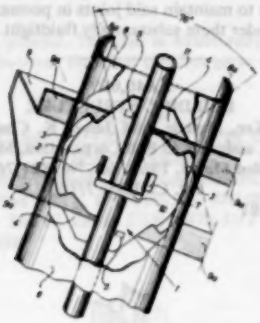
under pressure enters the fluidtight enclosure, tension on at least one cable is increased and is operatively transferred by the outer lid to the inner lid for urging the inner lid into tighter engagement with the portion of the pressure vessel surrounding the opening.

3,640,033

PANEL HOLDER FOR WALL OR CEILING FINISH WITH PANELS ARRANGED ON THE SUPPORTING MEMBERS

Willem Rijnders, Ridderkerk, Netherlands, assignor to Hunter Douglas International Ltd., Pointe Claire, Quebec, Canada

Filed June 16, 1969, Ser. No. 833,635
Claims priority, application Germany, June 14, 1968, P 17 59 845.7
Int. Cl. E04c 5/16; A44b 21/00
U.S. Cl. 52—36 8 Claims



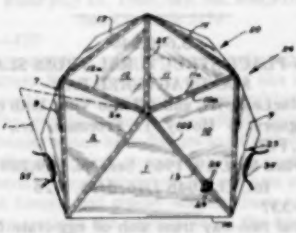
The panel holder disclosed is in the form of a flat plate generally in the shape of a pie plate including a flat central section provided with opposite panel-supporting segments projecting from one surface for respectively engaging the opposite margins of a panel, said segments being parallel to the plane of the wall or ceiling finish and having an arcuate peripheral shape in said plane. Opposed attachment tabs extend from the opposite face of the plate for securing the holder to a support, the segments and tabs alternating around the peripheral portion of the holder with the tabs arranged to engage a support when the holder is rotated relative thereto. The holder may be cut from sheet plate material and cut and formed to provide the panel-supporting segments and the attachment tabs.

3,640,034

COLLAPSIBLE SHELTER STRUCTURE

Robert H. Shotwell, Jr., 11400 Valley Ct., Burnsville, Minn.

Filed Mar. 2, 1970, Ser. No. 15,760
Int. Cl. E04b 1/344, 7/10
U.S. Cl. 52—70 2 Claims



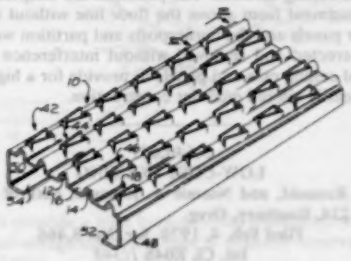
A collapsible shelter comprising a polyhedron in form and being formed of a unitary strip of substantially rigid sheet material, said strip comprising hinged triangular portions, said portions being so disposed as to have said strip arranged to form a sidewall and a top cover of said shelter and means releasably securing the abutting free edges of said portions.

3,640,035

ANTISLIP SAFETY SURFACE

Max E. Butterfield, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 27, 1970, Ser. No. 32,096
Int. Cl. E04f 11/16
U.S. Cl. 52—177 8 Claims



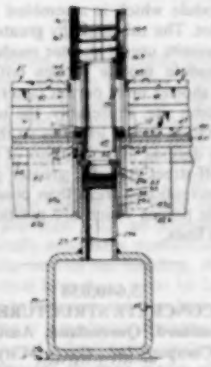
An antislip safety surface consisting of a plate member having a plurality of parallel, spaced corrugations or ridges formed therein, and a plurality of overlapping, spaced rows of apertures formed in said ridges by bending upward the ridge material on either side of a diagonal center cut to produce vertical projections having oppositely sloping edges providing a maximum multidirectional holding effect. In an alternate embodiment, adjacent nonoverlapping rows of apertures have located therebetween a plurality of transverse drain apertures.

3,640,036

ARCHITECTURAL SYSTEM OF INTERIOR MODULAR CONSTRUCTION

Yoshio Nakazawa, Evanston, and Harold A. Lipper, Chicago, both of Ill., assignors to Yosh Nakazawa & Associates, Inc., Evanston, Ill.

Original application Mar. 22, 1968, Ser. No. 715,281, now Patent No. 3,503,166, dated Mar., 1970. Divided and this application July 15, 1969, Ser. No. 870,942
Int. Cl. E04b 5/10, 5/43, 5/58
U.S. Cl. 52—126 7 Claims



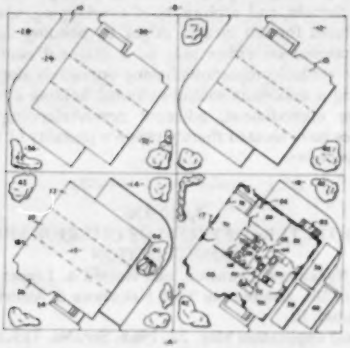
An architectural system of modular construction for building structures including floor and ceiling rails or stringers

forming rectangular floor and ceiling sections in vertical alignment with one another, pedestals adapted to be supported on a structural concrete floor for supporting the floor rails, suspension rods adapted to be hung from a structural concrete ceiling for supporting the ceiling rails and vertical cornerposts which may be erected at the corners of any of the vertically aligned floor and ceiling sections to extend between the floor and ceiling rails. Panels for the floor and ceiling are supported in the same plane as the floor and ceiling rails. Thus the panels are disposed adjacent the rails, and do not overly the rails. Partition wall panels may be mounted between the erected corner posts in abutting relation with the floor and ceiling rails for selective partitioning of the floor and ceiling sections. The pedestals are adapted for vertical adjustment from above the floor line without removing the floor panels and the cornerposts and partition wall panels can be erected and removed without interference with the floor and ceiling rails and panels to provide for a highly flexible and easily altered modular construction.

3,640,037
LOW-COST HOUSING

Fred S. Renauld, and Noemie A. Renauld, both of Route 3, Box 1224, Rosebury, Oreg.

Filed Feb. 4, 1970, Ser. No. 8,466
Int. Cl. E04b *1/348*
U.S. Cl. 52—169 **7 Claims**



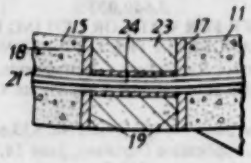
Three-module, prefabricated or mobile homes are described in combination with a unique angular placement of the homes in a mobile home park which provides maximum privacy and enjoyment of the home site. The homes comprise a utility core module which is assembled to two additional modules on the lot. The substantially greater width of the assembled home permits use of shorter modules than the conventional two-module mobile homes without sacrifice of floor space. The shorter units permit faster and simpler positioning on the home site. Preferably, the units are placed at an angular orientation to the lot lines so that four triangular areas are thereby defined in the corners of the lot which provide increased off-street parking, greater privacy and more useful outdoor recreational areas than possible with conventional two-module homes which are positioned on their lots parallel to the lot lines.

3,640,038
CONCRETE STRUCTURES

James Heron, Samford, Queensland, Australia, assignor to The Pre-Load Company Inc., Garden City, N.Y.

Filed Sept. 19, 1969, Ser. No. 859,318
Int. Cl. E04b *1/06, 7/20*
U.S. Cl. 52—224 **9 Claims**

In a structure comprising a precast concrete sections, the sections are arranged in generally edgewise relationship and the edge portions of adjacent sections are spaced apart and have relatively flexible or resilient material (such as bituminous or elastomeric material) applied thereto; a mass of setting composition is provided between the edge portions of

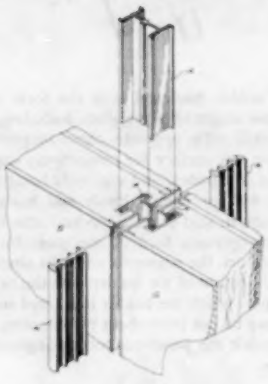


each two adjacent sections, to form joints between said sections, and the structure is stressed by means of stressing rods or cables so as to maintain said joints in permanent compression and to render them substantially fluidtight.

3,640,039
BUILDING STRUCTURE

James R. McKee, Muncie, and James K. Chastain, Gaston, both of Ind., assignors to Ball Corporation, Muncie, Ind.

Filed May 5, 1969, Ser. No. 821,761
Int. Cl. E04c *1/10*
U.S. Cl. 52—281 **10 Claims**



An assembly structure for building panels having undercut channels in the end portions thereof wherein a key is inserted into a plurality of such channels to loosely join the panels, and resilient inserts are thereafter driven into spaces between the panels to render the junction rigid, and a method of joining the assembly by progressively positioning the inserts.

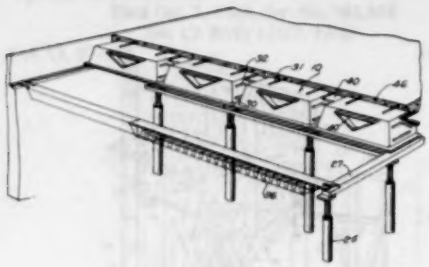
3,640,040
CAST-IN-PLACE STRUCTURAL TRUSS SLAB AND MANUFACTURED PAN

Charles C. MacLean, III, and Alfonso Villa, both of San Juan, P.R., assignors to Hovey T. Freeman, Jr., Barrio Rio Guaynabo, P.R.

Filed Sept. 19, 1969, Ser. No. 859,289
Int. Cl. E04b *1/16, 5/16, 5/26*
U.S. Cl. 52—337 **5 Claims**

A structural two-way truss slab of egg-crate form is provided with manufactured pans that have openings in the sidewalls thereof with interconnecting members between the openings. The arrangement is such that the pan can remain in place and thus provide a finished ceiling effect. The system

further provides an ability to run air-conditioning, electrical, plumbing and other conduits through the slab itself after the

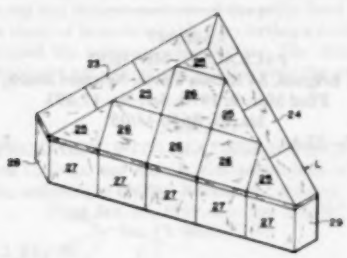


slab has been poured. The slab is structurally equivalent to conventional two-way slabs but is of less gross weight.

3,640,041
TRIANGULARLY SHAPED CONCRETE SEAT WITH TILE COVERING

Roy E. Michieli, 545 Begier Ave., San Leandro, Calif.

Filed Dec. 4, 1969, Ser. No. 882,007
Int. Cl. E04f *13/18*; **A47k** *3/12*
U.S. Cl. 52—390 **2 Claims**



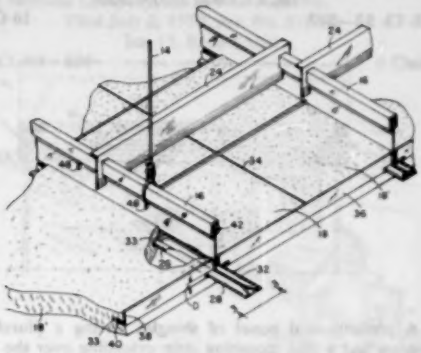
A triangularly shaped seat covered with tile along its top, hypotenuse side, and bottom margins which border a triangular recess in the bottom.

3,640,042
ACCESS-PROVIDING DIRECT SUSPENDED CEILING STRUCTURE WITH REMOVABLE LOCKED-IN TILE SECTIONS

Bruce W. Kidney, 57 Montague St., Brooklyn, N.Y.

Filed July 11, 1969, Ser. No. 840,910
Int. Cl. E04b *5/54*
U.S. Cl. 52—475 **21 Claims**

An access-providing, rigid, properly aligned, suspended ceiling structure for acoustic tiles and the like is described, having removable locked-in tile sections and hidden support structure. The structure employs selectively shaped horizontal parallel beams which have flanges to fit within tile kerfs to provide a tile-supporting structure, which is hidden from view of persons in the room below. Spacer bars extend across between the beams and rigidly anchor them in place. Enlarged ceiling sections are removable by the employment of crossbars sized to fit in tile kerfs between beams with the ends of the crossbars being provided with selectively sized cutouts to permit free longitudinal, unobstructed movement of slidable splines located on the beam flanges. The slidable splines have lengths smaller than tile dimensions supported by the beam flanges and are movable within tile kerfs for ceiling section removal. The horizontal parallel beams are

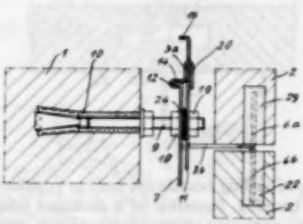


shaped to provide a high load-carrying capability, with their shaping advantageously employed to enhance removability of individual tiles.

3,640,043
WALL FACING

Hermann Querfeld, Hannover; Heinz Otto Mattes, and Friedrich Flesch, both of Emmendingen, all of Germany, assignors to Max Langensiepen Kom. Ges., Emmendingen, Germany

Filed June 29, 1970, Ser. No. 50,046
Claims priority, application Germany, June 30, 1969, P 19 33 085.9; Jan. 23, 1970, G 70 02 245.6
Int. Cl. E04b *2/88*
U.S. Cl. 52—508 **10 Claims**



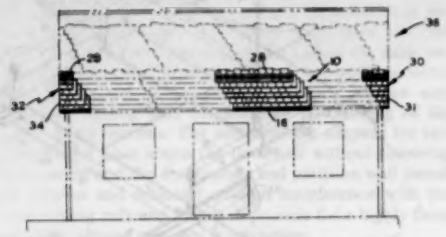
A wall facing consists of facing plates which are situated at a distance from the wall of a building, mounted in pairs on those branches of angular bearing rails which face away from the wall of the building and held in position by securing elements in the form of lugs affixed in a vertical position to the horizontal branch of each bearing rail. The securing elements extend into upper and lower recesses in the edges of the facing plates, each of said bearing rails being designed so that its vertical branch, provided with an elongated slit, can be screwed in a vertically adjustable position onto a wall clamp connecting it to the wall of the building. A first plate is attached to the vertical branch so as to be longitudinally displaceable in a guide between the two branches and has an elongated slot rising at a moderate angle and crossing that of the vertical branch and delimiting an aperture to give passage to a threaded portion of the wall clamp. A second plate is vertically displaceable on the vertical branch of the bearing rail and contains an inclined elongated slot which crosses over the elongated slot of the longitudinally displaceable plate in the opposite direction.

3,640,044

PREFABRICATED PANEL OF SHINGLES

Raymond W. Watts, 4 Nash's Lane, Westport, Conn.

Filed Sept. 11, 1969, Ser. No. 856,981
Int. Cl. E04d 3/365, 1/20
U.S. Cl. 52—543 10 Claims



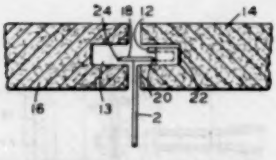
A prefabricated panel of shingles having a plurality of courses and a thin mounting strip extending over the upper face of the shingles in each course and secured thereto. The strip is so positioned relative to the lower edge of the shingles in each course as to be covered by the lower margin of the shingles of the next course. Staples extending through the thin strip and through each shingle on adjacent opposed vertical edges thereof.

3,640,045

APPARATUS AND METHOD OF INSTALLING A SPLINE IN A CEILING BOARD JOINT

Charles F. Gilbo, Lancaster, and Norman A. Johnson, Lititz, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Feb. 19, 1970, Ser. No. 12,620
Int. Cl. E04b 5/52; E04g 21/16
U.S. Cl. 52—747 2 Claims



A plurality of ceiling boards are held in position by splines stapled to a backing. Removal of a damaged board is complicated by the replacing of the spline which is inserted into a kerf in two adjacent boards. The replacement is accomplished by the use of a narrow spline which fully fits in the kerf of one board and, after the boards are in place, a special tool is used to slide the spline from the kerf of one board to a position where it is positioned with one-half of its width in the kerf of each adjacent board. Staples may now be passed through the spline to hold the boards in position.

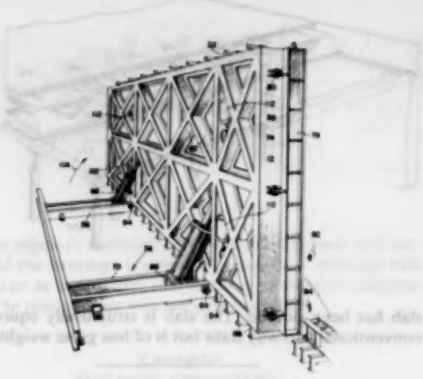
3,640,046

MEANS FOR PREFABRICATING BRICK PANELS

Yngve R. Anderson, Streetsville, Ontario, and George K. Escott, Willowdale, Ontario, both of Canada, assignors to Canadian Structural Clay Association, Willowdale, Ontario, Canada

Filed Jan. 22, 1970, Ser. No. 4,844
Int. Cl. E04g 21/22
U.S. Cl. 52—749 9 Claims

Prefabricated brick panels are formed course by course on a table, starting against a movable footing course. Course spacers and individual brick spacers are laid in advance of each course and brick respectively. The table has a roller platform projecting from the edge opposite that alongside which the courses are laid. The footing and finished courses are successively pushed towards the platform to bear against it. When sufficient courses are laid to constitute a panel a cement grout is poured between the bricks. As soon as it has stiffened enough to support the bricks as a panel the table is rotated into the vertical and the panel rolled off in the plane. The footing riding the rollers of the platform for further curing of the panel.

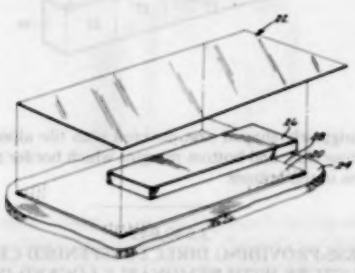


3,640,047

PACKAGING METHOD

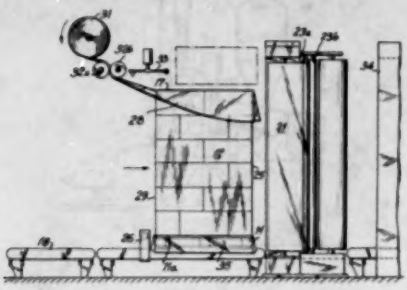
Clifford N. Brignall, 54 Balboa Coves, Newport Beach, Calif.

Filed Mar. 9, 1970, Ser. No. 17,693
Int. Cl. B65b 43/08
U.S. Cl. 53—22 A 7 Claims



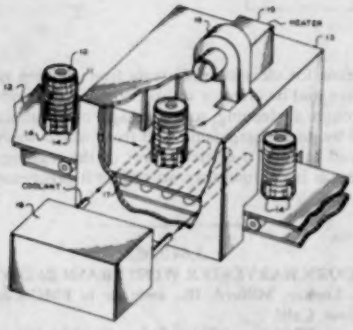
A method of making a package for displaying articles for sale. The method includes positioning a die over a porous or perforated backing card and a transparent plastic cover film over the die and card. A vacuum is then applied to the underside of the card so as to bond the film to the face of the card. The die is then removed to expose a pocket that receives the article or articles to be displayed. The portion of the film adjacent the open end of the pocket may be heat sealed to the card or alternatively bent around the card to retain the article or articles in place. In modification of the method, a transparent formed shield may be interposed between the transparent film and the backing card to provide for crushable or sharp-pointed articles. Also, a chemically protective shield may be interposed between the face of the backing card and the pocket.

3,640,048
METHOD AND APPARATUS FOR A PALLET LOAD
Seymour Zelnick, Orange, N.J., and Martin Michael Wildmoser, Staten Island, N.Y., assignors to Weldotron Corporation, Newark, N.J.
Filed Oct. 7, 1968, Ser. No. 765,302
Int. Cl. B65b *11/10, 53/02*
U.S. Cl. 53—30 11 Claims



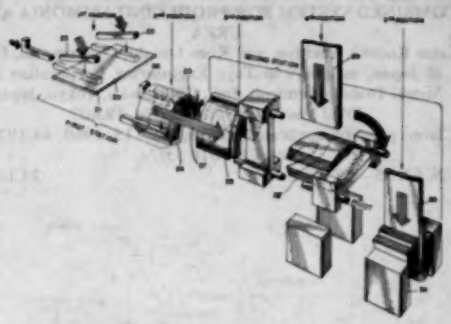
A pallet load of product is secured onto a pallet by forming a sleeve of heat-shrinkable film around the pallet load with its open top extending above the pallet load and its open bottom extending below the platform of the pallet. One or both of the top and bottom surfaces of the pallet load are covered with a sheet of heat-shrinkable film having a portion extending beyond the corresponding surface. The sheet or sheets and the sleeve are shrunk and fused around the pallet load.

3,640,049
PACKAGING WITH HEAT-SHRINKABLE FILM
Richard C. Fritz, and Aldo B. Galvanoni, both of Cincinnati, Ohio, assignors to Phillips Petroleum Company
Filed Jan. 29, 1969, Ser. No. 795,097
Int. Cl. B65b *53/06*
U.S. Cl. 53—30 1 Claim



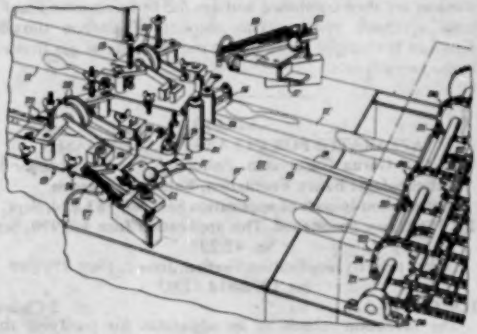
A stack of articles is packaged in a bag or sheet of heat-shrinkable film. Film at the bottom of the stack is not heat shrunk so that individual articles can be removed without destroying the package.

3,640,050
BAG-BOXING MACHINE
Ernst Daniel Nystrand; Harvey J. Spencer, and Paul Ziegelhoffer, all of Green Bay, Wis., assignors to Paper Converting Machine Company, Inc., Green Bay, Wis.
Filed July 2, 1970, Ser. No. 51,976
Int. Cl. B65b *63/04*
U.S. Cl. 53—120 6 Claims



A machine for introducing a twice-folded stack of bags into a carton wherein the bags are singly delivered through a first path to a partial folding support, thereafter a partially folded stack being conducted along a second path into a housing consisting of two pivotally interconnected jaws and finally the once-folded stack is ejected from the housing which achieves a second fold in the stack incident to introducing the twice-folded stack into a carton.

3,640,051
TUBE-FORMING PACKAGING MACHINE
William S. Cloud, Jr., 730 Greenwood Ave., Wilmette, Ill.
Filed Apr. 13, 1970, Ser. No. 27,550
Int. Cl. B65b *9/06*
U.S. Cl. 53—178 7 Claims



A strip of plastic film is formed into a tube with a succession of articles enclosed in the tube. As the tube is sealed and the trim cut from it, the trim is drawn around the roller on which it is cut more than 90° and around a guide roller to move parallel to the tube. Pairs of pulling bars grip the tube and the trim to pull both, and to seal the tubes between the articles therein. Projecting sponge rubber on the bars seizes the trim in a way tending to pull it faster than the tube, yieldably. The gripper bars are secured firmly at the two ends

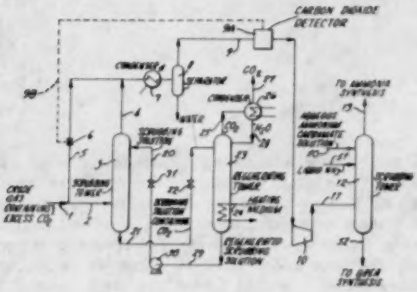
and loosely at an intermediate point so that the bar is controlled even if one of the securing means fails. A rubber band parallel to the bars aids in ejecting the completed and severed packages. Two lines of articles may be packed in one web by forming a tube around the two lines and simultaneously slitting and heat-sealing between the two lines to form two tubes.

3,640,052

PROCESS FOR REMOVING CARBON DIOXIDE IN A COMBINED SYSTEM FOR PRODUCING AMMONIA AND UREA

Keizo Konoki, Yachiyo, and Kozo Ohsaki, Oguramachi, both of Japan, assignors to Toyo Engineering Corporation and Mitsui Toatsu Chemicals, Inc., Chiyoda-ku, Tokyo, Japan

Filed Mar. 11, 1970, Ser. No. 18,607
Claims priority, application Japan, Mar. 15, 1969, 44/19259
Int. Cl. B01d *53/14*
U.S. Cl. 55—19 **7 Claims**



A process and apparatus for removing excess carbon dioxide from a crude ammonia synthesis gas to be used for producing ammonia and urea, in which the incoming crude ammonia synthesis gas is separated into two streams. One stream is flowed into a scrubbing zone wherein it is contacted with a scrubbing solution so that the partial pressure of the carbon dioxide in the one stream leaving the scrubbing zone is in the range of about 0.02–1.5 atmospheres, under a total pressure of above about 10 atmospheres, at a temperature of about 85°–130° C. The other stream is not scrubbed. The two streams are then combined and are fed to an ammonia and a urea synthesis system. The amount of carbon dioxide removed is changed by adjusting the amounts of gas flowing in the two streams.

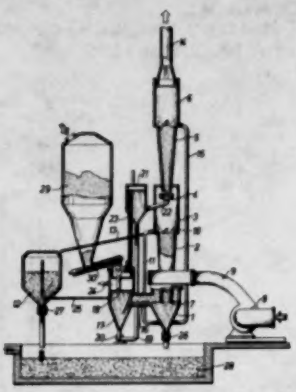
3,640,053

APPARATUS FOR CLEANSING FLUE GASES

Karl-Axel Goran Gustavsson, Enkoping, Sweden, assignor to Aktienbolaget Bahco Ventilation, Enkoping, Sweden

Continuation-in-part of application Ser. No. 763,424, Sept. 27, 1968, now abandoned. This application June 1, 1970, Ser. No. 42,231
Claims priority, application Sweden, June 2, 1969, 7759/69
Int. Cl. B01d *47/02*
U.S. Cl. 55—227 **2 Claims**

The invention relates to an apparatus for purifying the gases to remove sulphur dioxide. The apparatus comprises a container for a body of treatment liquid and is provided with a gas inlet so arranged that the gas is caused to flow substantially at right angles to the surface of the liquid therein. A treatment passage extends substantially vertically upwards from the liquid surface in the container, so that the gas after contact with the liquid flows substantially linearly therethrough entraining droplets of liquid. The container communicates below the liquid level with an equalizing tank having means for introducing alkali thereinto to maintain the treatment liquid at a suitable alkalinity and with means for introducing fresh water. The equalizing tank also has means to maintain the liquid level therein constant whereby the liquid level in the treatment container adjusts automatically



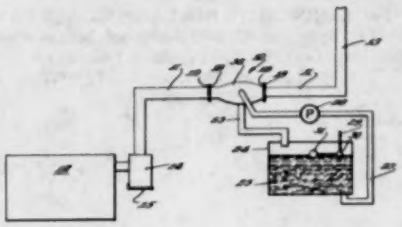
to variations in the rate of gas supplied thereto. The invention also includes means in the equalizing tank for accelerating the admixture of powdered alkali in the liquid.

3,640,054

CLEANING POLLUTANTS FROM FURNACE AND INCINERATOR SMOKE AND THE LIKE

Norman Katz, 2150 W. Smithwick Lane, Hoffman Estates, Ill.

Filed Apr. 17, 1970, Ser. No. 29,553
Int. Cl. B01d *47/06*
U.S. Cl. 55—228 **12 Claims**



A means for cleaning pollutants from moving gases, such as furnace and incinerator smoke, comprising conducting the gas through a cleaning zone passage of substantial length defined by an encompassing wall from which washing liquid is sprayed to form a dense shower of the washing liquid so that the gas is continuously washed as it progresses through the shower.

3,640,055

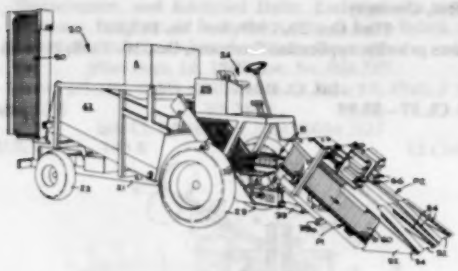
CORN HARVESTER WITH TRASH BLOWER

Olin L. Looker, Milford, Ill., assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 29, 1969, Ser. No. 854,227
Int. Cl. A01d *45/02*
U.S. Cl. 56—106 **4 Claims**

A corn harvester particularly adapted for harvesting market corn has two picker heads which deliver severed ears to a takeaway conveyor. Slide panels project upwardly and outwardly from the sides of the conveyor and a specially constructed blower is disposed above the conveyor and the picker heads for directing streams of air laterally. As the crop

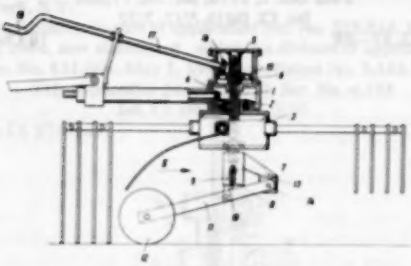
slides down the slide panels it is cleaned of trash with counterflowing streams of air. The blower has superposed fans with front, rear, top and bottom inlets and louvered side outlets.



3,640,056
HAY-HARVESTING IMPLEMENTS

Martin Maier, and Eberhard Wolf, both of Gottmadingen, Germany, assignors to Maschinenfabrik Fahr Aktiengesellschaft, Gottmadingen, Germany

Filed Oct. 13, 1969, Ser. No. 865,800
Claims priority, application Germany, Nov. 6, 1968, P 18 07 318.2
Int. Cl. A01d *79/00*
U.S. Cl. 56—370 **8 Claims**



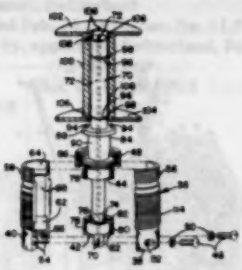
A hay-harvesting machine of the type using a tined body rotating about a vertical axis, comprises a ground-engaging wheel mounted on a pivoting support arm whose inclination can be changed, for adjusting the ground clearance of the implement, by means of a threaded rod, which can be turned to cause it to move vertically, and whose lower end is guided in bearing means and is connected with the arm by means of one or more links in a pivoting manner.

3,640,057
YARN-COVERING APPARATUS

Tony R. Branson, P.O. Box 2229, Burlington, N.C.

Filed Jan. 28, 1970, Ser. No. 6,393
Int. Cl. D01h *7/12, 7/88;* **B65h** *49/20*
U.S. Cl. 57—18 **8 Claims**

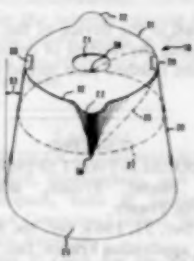
A spindle unit for wrapping a covering yarn about a core yarn being drawn therethrough includes a spindle shaft supported by bearings within a hollow casing. The shaft includes a portion of substantially uniform cross section extending from the casing having a spindle whorl secured thereto. Pin members directed axially of the shaft and O-rings provided within grooves on the portion of the shaft having a uniform cross section drivingly engage yarn covering packages mounted thereon.



3,640,058
APPARATUS

Irby Ennis Hartley, Jr., Chattanooga, Tenn., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 27, 1970, Ser. No. 67,527
Int. Cl. D01h *1/38, 9/02;* **B65h** *67/04*
U.S. Cl. 57—34 TT **6 Claims**



A waste spool for use with a ring twister comprising a frustoconical body member having a pair of tabs extending outwardly from its top surface. The particular structural relationship of the tabs with the tapered surface of the body member, coupled with a specified taper of the body member, provide a starting location for the waste windings that will enable their easy removal as a circular yarn wrap over the end of the waste spool.

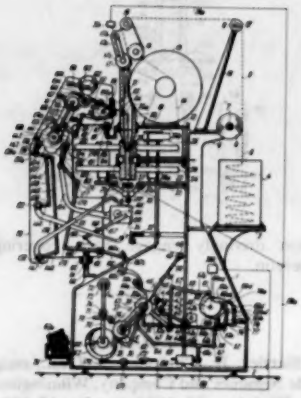
3,640,059
METHOD OF SPINNING-IN YARN UPON INTERRUPTION OF THE SPINNING PROCESS IN SPINDLELESS SPINNING MACHINES AND DEVICE FOR PERFORMING SAID METHOD

Josef Lutovsky, Liberec, and Vladimir Prasil, Brno, both of Czechoslovakia, assignors to Elitex-Zavodny textilniho strojirenstvi generalni reditelstvi, Liberec, Czechoslovakia

Filed Oct. 8, 1969, Ser. No. 864,772
Claims priority, application Czechoslovakia, Oct. 10, 1968, 7145/68
Int. Cl. D01h *13/26*
U.S. Cl. 57—34 R **10 Claims**

A method and apparatus for spinning-in yarn into a spindleless spinning machine when, during the operation thereof, the spinning process has been interrupted due to the breakage of the main yarn thread. The device of the invention is provided with an automatic knotting mechanism which automatically feeds into a spinning nozzle an auxiliary yarn thread. The impurities in the spinning nozzle, as well as

the fiber material located therein, is spun onto the auxiliary thread which is then automatically knotted to the broken-off end of the finished yarn thread by the knotting mechanism.



Means are provided in the device of the invention for automatically interrupting the feeding of unfinished fibers as well as the takeup of the finished yarn thread during the knotting operation.

3,640,060

DOUBLE-TWIST SPINDLE

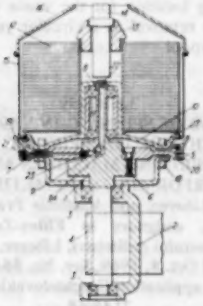
Jacques Boyer, Sauzet, France, assignor to Societe Rhodiaceta, Paris, France

Filed Dec. 31, 1969, Ser. No. 889,646

Claims priority, application France, Dec. 31, 1968, 50,893

Int. Cl. D01h *7/86, 1/10*

U.S. Cl. 57—58.84 **5 Claims**



A double-twist spindle for doubling a yarn in which an integral shaft and rotor rotate with respect to a stator, which is magnetically held against rotation and carries a spool of yarn. An axial and a radial passage in the shaft and rotor respectively join in the rotor at the location of a removable, normally fixed yarn guide.

3,640,061

METHOD AND APPARATUS FOR SPINNING A FIBER BAND

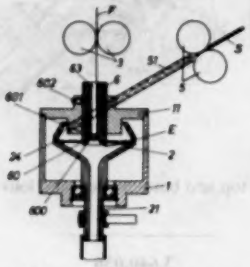
Hans Landwehrkamp, Ingolstadt, Germany, assignor to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed Oct. 20, 1969, Ser. No. 867,607

Claims priority, application Germany, Oct. 30, 1968, P 18 06 054.3

Int. Cl. D01h *7/00, 1/12*

U.S. Cl. 57—58.89 **3 Claims**



A spinning apparatus comprises a spinning chamber, a centrally arranged thread drawoff tube for drawing off thread from the spinning chamber, the thread drawoff tube opening having a radial outer smooth face extending into the path of the thread and an interior annular face which is rough or notched.

3,640,062

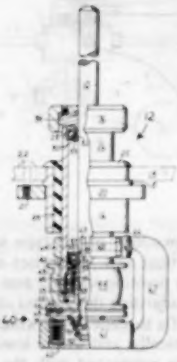
SPINDLE ASSEMBLY

Gordon C. Anderson, and John D. Page, both of Clemson, S.C., assignors to Maremont Corporation, Chicago, Ill.

Filed Oct. 1, 1970, Ser. No. 77,058

Int. Cl. D01h *7/12, 7/22*

U.S. Cl. 57—88 **10 Claims**



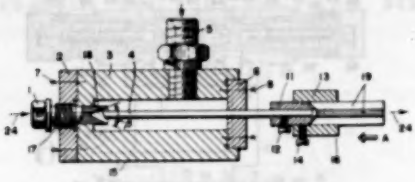
An improved spindle assembly for textile spinning and twisting machines is disclosed wherein a plurality of spindle blade supporting ball bearing sets and a whirl-supporting ball bearing set are aligned and supported by a single support sleeve concentric with the spindle blade which sleeve vertically terminates intermediate the whirl. One or more of said sets may have a flexible or resilient member interposed between a bearing set and the sleeve and/or the whirl and/or the spindle blade to help provide and maintain the precise alignment required of all sets from the axial centerline of the spindle blade. Also disclosed is an electromagnetically operable drive and brake clutch subassembly which is positionally adjustable on and supported by the sleeve.

3,640,063

PROCESS AND APPARATUS FOR CRIMPING YARNS AND THE LIKE

Hans Schmid, Ludwigshafen; Heinrich Feldhoff, Bad Duerkheim; Wolfgang Martin, Ludwigshafen; Heinz Fessmann, Neumuenster, and Edeleried Hahn, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed Sept. 10, 1969, Ser. No. 856,557
Claims priority, application Germany, Sept. 13, 1968, P 17 85 344.0
Int. Cl. D02g *1/16, 3/24;* D01d *5/22*
U.S. Cl. 57—140 R 12 Claims



Process and apparatus for crimping yarns or the like by the action of a heated flowing gaseous medium, the yarns being exposed to the heated flowing gaseous medium in two successive treatment chambers. Yarns of synthetic linear high molecular weight substances can be crimped by means of the process and apparatus according to the invention in a simple way and at high yarn speeds.

3,640,064

NOVELTY YARN

Clifford W. Palm, Denver, N.C., and William R. Gibson, Cumberland, Md., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 359,814, Mar. 25, 1964, now abandoned , which is a division of application Ser. No. 811,066, May 5, 1959, now Patent No. 3,144,747.
This application Jan. 19, 1970, Ser. No. 4,155
Int. Cl. D02g *3/34, 3/36*
U.S. Cl. 57—144 7 Claims

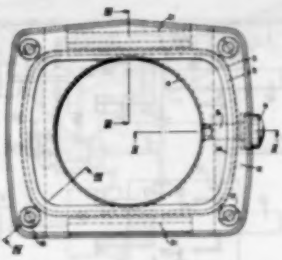
A continuous filament slub yarn is described which comprises a substantially unbulked core yarn and an auxiliary yarn having slubbed and unslubbed portions along its linear length. The auxiliary yarn supplies the slubs in a random distribution and random size along the length of the yarn by looping upon itself and attaching to the core yarn by interlacing at least some of the auxiliary yarn filaments through the core yarn.

3,640,065

WATERTIGHT WATCHCASE FOR WRISTWATCHES

Marc Lederrey, and Canton Grenchen, both of Soleure, Switzerland, assignors to Schlup & Cie., S.A., Lengnau b. Biel (Canton of Berne), Switzerland

Filed Feb. 16, 1970, Ser. No. 11,592
Claims priority, application Switzerland, Feb. 17, 1969, 2363/69
Int. Cl. G04b *37/08*
U.S. Cl. 58—90 R 5 Claims



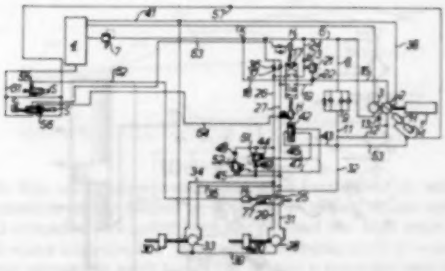
An internal capsule constituted by a vessel made of a soft plastic material and by the watchglass is kept closed by an external capsule constituted by two metallic pieces fixed onto one another by screws. These pieces press the glass axially on the upper edge of the lateral portion of the plastic vessel so as to form a tight seal therebetween. The watch movement is held in place within the internal capsule by clamping. The lateral portion of the plastic vessel is therefore transversely compressed between the movement and one of the metallic pieces of the outer capsule.

3,640,066

HYDRAULIC POWER TRANSMISSION SYSTEMS

John Stephen Marshall, Birmingham, and William S. Turnbull, Wolver-Hampton, both of England, assignors to Rubery, Owen and Company Limited, Darlaston, Wednesbury, Staffordshire, England

Filed Dec. 9, 1969, Ser. No. 883,658
Claims priority, application Great Britain, Dec. 10, 1968, 58,619/68
Int. Cl. F16d *31/00;* F15b *11/16*
U.S. Cl. 60—53 R 7 Claims



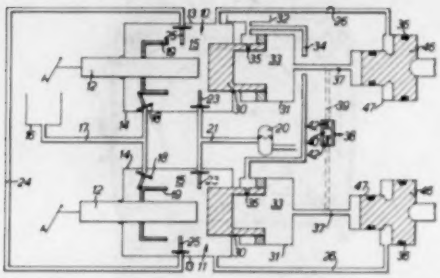
When the fluid supply to an hydraulic motor normally driving a vehicle is insufficient to maintain the momentum of the vehicle, pressure reversal occurs in the motor which then acts as a pump. A relief valve, in addition to the main relief valve, is included in the vehicle transmission system to limit the pressure in the system only when this overrun condition occurs. When the system includes two or more motors a valve is provided to isolate one of the motors from the fluid supply. A single valve assembly includes the additional relief valve, its ancillary control valves and the isolating valve.

3,640,067

TWO-PEDAL HYDRAULIC BRAKING SYSTEM

Brian Ingram, Warwickshire, England, assignor to Girling Limited, Tyseley, Birmingham, England

Filed Mar. 31, 1970, Ser. No. 24,195
Claims priority, application Great Britain, May 8, 1969, 23,442/69
Int. Cl. F15b 7/00
U.S. Cl. 60—54.6 P 11 Claims



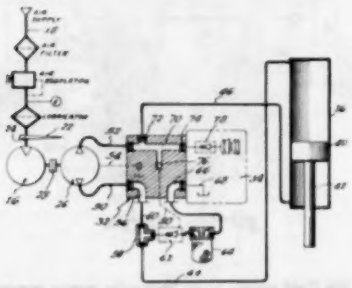
A two-pedal hydraulic braking system incorporates two separate pedal-operated master cylinders. Each master cylinder includes a pressure space in a cylinder bore in front of a pedal-operated piston working in the bore. The pressure spaces are connected by a transfer connection which permits fluid to pass between the pressure spaces to compensate for uneven wear of the linings of brakes on opposite sides of the vehicle. Normally communication between each master cylinder and the transfer connection is cut off by a normally closed valve which is opened when the piston is moved axially in the bore.

3,640,068

ARBOR PRESS POWER SOURCE

Robert L. Mann, Park Ridge, Ill., assignor to Resinoid Engineering Corporation

Filed Dec. 10, 1969, Ser. No. 883,864
Int. Cl. F15b 15/18
U.S. Cl. 60—52 HF 3 Claims



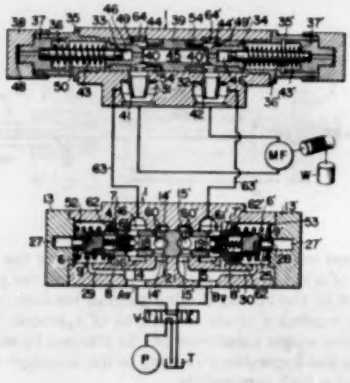
A power drive for an arbor press combining a rotary compressed air motor coupled with a variable volume reversible hydraulic pump supplying hydraulic fluid under pressure to a piston and cylinder moving the ram of the press whereby combinations of speed, direction and pressure at the ram may be manually achieved with stalling of the drive being inconsequential to the operativeness of the drive.

3,640,069

OIL-PRESSURE-CONTROLLING DEVICE FOR BIG INERTIAL LOAD

Takashi Sugahara; Minoru Suzuki; Tadayuki Fukunaga, all of Akashi-shi, Hyogo, and Shozo Fukushima, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe-shi, Hyogo, Japan

Filed Aug. 14, 1969, Ser. No. 850,034
Claims priority, application Japan, Aug. 14, 1968, 43/58152
Int. Cl. F15b 11/08, 13/04; F01k 13/00; F22b 33/00
U.S. Cl. 60—105 5 Claims



Cavitation and stalling of a hydraulic motor coupled to a large inertial load is prevented by a self-operating valve sensitive to applied oil pressure and the pressure of oil returned to the sump for controlling the pressurized fluid operating on the hydraulic motor.

3,640,070

HYBRID PROPELLANT SYSTEM

Martin H. Kaufman; John D. O'Drobinak, and James O. Duke, Jr., all of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 28, 1964, Ser. No. 407,262
Int. Cl. C06d 5/10
U.S. Cl. 60—220 5 Claims

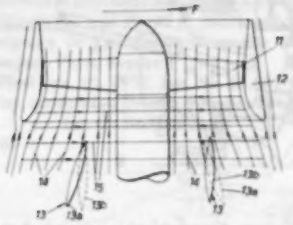
1. The method for creating propulsive thrust by burning a solid phase with a liquid phase injectant and exhausting the products from a rocket nozzle; said solid phase comprising from 17 to 22 percent by weight of a fluorocarbon binder selected from the group consisting of 1H, 1H, 9H-Hexadecafluoro-1-nonanomethacrylate, 1H, 1H, 7H-Dodecafluoro-1-heptanoacrylate, 1H, 1H, 5H-Octafluoro-1-pentanoacrylate and mixtures thereof; a plasticizer selected from the group consisting of triethylene glycol dinitrate, pentaerythritol trinitrate, trimethylol ethane trinitrate, butanediol dinitrate, a copolymer of vinylidene fluoride and perfluoropropylene, bis(2-fluoro-2,2-dinitroethyl)formal and mixtures thereof; and a free radical catalyst selected from the group consisting of azo-bisisobutyronitrile, benzoyl peroxide, dichlorobenzoyl peroxide, and methylethylketone peroxide; from 10–22 percent by weight of a metal fuel being a member selected from the group consisting of aluminum, beryllium, zirconium, thorium, uranium, boron, and mixtures thereof; and from 43 to 55 percent by weight of an oxidizer comprising a member selected from the group consisting of ammonium perchlorate, sodium perchlorate, potassium perchlorate, sodium nitrate, potassium nitrate, and barium nitrate; said liquid phase injectant comprising from 4 to 12 percent by weight of a member selected from the group consisting of hydrazine, monomethylhydrazine, unsymmetrical

dimethylhydrazine, perchlorofluoride, tetrafluorohydrazine, hydrogen peroxide, nitric acid, tetranitromethane, tri(difluoroamine)fluoroethane, and mixtures thereof.

3,640,071
DUCTED PROPELLER SYSTEMS FOR MARINE VESSELS

Ewan Christian Brew Corlett, Basingstoke, England, assignor to Hydroconic Limted, Basingstoke, Hampshire, England

Filed Sept. 29, 1970, Ser. No. 76,508
Claims priority, application Great Britain, Oct. 13, 1969, 50,217/69
Int. Cl. B63h *11/10*
U.S. Cl. 60—221 **3 Claims**

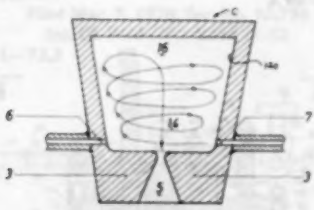


In a ducted propeller system for ship propulsion, comprising a propeller working in a fixed propulsion nozzle and rudder blades or shutters disposed at the nozzle entry on either side of the central vertical fore-and-aft plane of the nozzle, the rudder blades are toed out and the angle of the toeing is varied up the height of each blade to correspond to the different nozzle flow entry conditions that obtain at different regions of the nozzle entry due to the effect of propeller rotation.

3,640,072
ROCKET ENGINE

Lutz Tilo Kayser, Am Bismarckturm 10, 7000 Stuttgart, Germany

Filed Aug. 1, 1969, Ser. No. 846,696
Claims priority, application Germany, July 20, 1968, P 17 51 740.7; June 11, 1969, P 19 29 629.8; P 19 29 628.7
Int. Cl. F02k *9/02*
U.S. Cl. 60—258 **3 Claims**

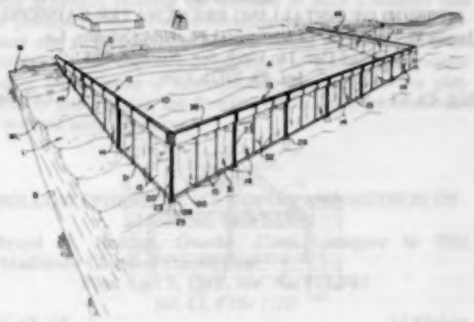


A rocket engine has an internal combustion chamber provided with a front wall. An outlet nozzle is provided in the front wall. At least two injection conduits communicate with the chamber rearwardly of the front wall in such a manner as to inject into the chamber respective streams of reactive propellants in direction tangentially of the chamber walls thus providing a short heat conduction path from the nozzle throat to the injected but yet unburned propellants rotating at high speed along the chamber walls.

3,640,073
BARRIER FOR DEFINING A SWIMMING AREA

Frank J. Samsel, 13455 Lake Ave., Lakewood, Ohio

Filed May 7, 1969, Ser. No. 822,400
Int. Cl. E02b *3/00, 15/00, 15/04*
U.S. Cl. 61—1 F **6 Claims**

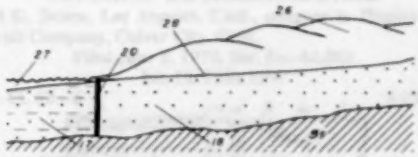


This invention relates to a floatable barrier comprising a plurality of sections or panel members, removably secured together to form an integrated structure for use in isolating or defining a confined area along the edge of a body of water, which area can be treated and made safe for human occupancy. Each section or panel member is formed of a flexible sheet of impervious material with the upper edge portion thereof overlapped to define a chamber coextensive with the width of the section for receiving floatable material which may be either a solid or a gas and the lower edge portion reinforced and secured to anchoring means, for maintaining the sections in a substantially vertical position when disposed within the water.

3,640,074
PROCESS FOR COLLECTING AND STORING FRESH WATER IN EARTH

Adolph Kopp, Jr., P.O. Box 137, Swan Lake, Mont.

Continuation-in-part of application Ser. No. 560,921, June 23, 1966. This application Oct. 24, 1969, Ser. No. 871,417
Int. Cl. E02b *3/02*
U.S. Cl. 61—1 R **6 Claims**



A thin water impermeable barrier is established in water permeable earth adjacent to the shore of a body of salt water and extended downward from the level of the high point of salt water intrusion into the water permeable earth to a nonwater-permeable earth layer. The barrier is extended laterally along the shore and upland from the shore to points where the nonwater-permeable earth layer is as high as said level, thus isolating an area of water permeable earth from the body of salt water. The salt water thus trapped in the water permeable earth is then extracted from the isolated water permeable earth by transferring it from the bottom part of the water permeable earth to the other side of the barrier. Fresh water is then stored in the isolated water permeable earth, thus establishing an available reservoir of fresh water. The barrier is formed and maintained by continuously circulating refrigerant downwardly from the level of the high point

of salt water intrusion through a row of closely spaced holes to the nonwater-permeable earth layer. The heat extracted from the earth in forming and maintaining the barrier is employed to evaporate water from the salt water adjacent to the barrier and return the fresh water thus recovered to the reservoir.

3,640,075

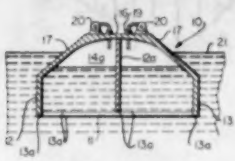
METHOD OF INSTALLING BREAKWATER CAISSONS

James H. La Peyre, 13 Richmond Pl., New Orleans, La.

Filed Oct. 16, 1969, Ser. No. 866,823

Int. Cl. E02b *3/06*

U.S. Cl. 61—5 **2 Claims**



This disclosure is directed to caissons and to a method of constructing seawalls, breakwaters, jetties, groins and the like utilizing the caissons which are closed sided, hollow, bottomless and compartmented precast concrete structures adapted to be air pressurized for flotation in water with their bottomless sides downward to the erection site and then depressurized and sunk into position and anchored against movement by imbedding in the water bottom and by filling with dredged and/or pumped in solids.

3,640,076

TUNNELS OR TUNNELLING

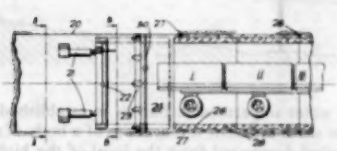
Donald Frank Rees, Wentworth; John Baron Garnett, Alresford, and Michael Alexander Richardson, Knaresborough, all of England, assignors to William F. Rees Limited, Old Woking, Surrey, England

Filed June 9, 1970, Ser. No. 44,809

Claims priority, application Great Britain, Sept. 4, 1969, 43,907/69

Int. Cl. E01g *5/04*

U.S. Cl. 61—42 **7 Claims**



A method of constructing a lined tunnel comprises the steps of excavating a short length of tunnel of internal diameter greater than the external diameter of the lining, erecting within the said length of tunnel a ring of three 120° lining segments, repeating the steps of excavating a short length of tunnel and erecting a lining ring within the short length, and pressing each successive ring into endwise engagement with the previously erected ring.

3,640,077

SHIELD TUNNELING METHOD

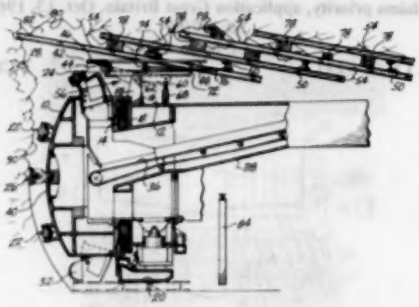
Frank George Watson, Victoria, and David Burnet Sugden, Tasmania, both of Australia, assignors to James S. Robbins and Associates, Inc., Seattle, Wash.

Filed Mar. 19, 1970, Ser. No. 21,032

Claims priority, application Australia, Mar. 5, 1970, 0528/70; Mar. 26, 1969, 52612/69

Int. Cl. E01g *5/00*

U.S. Cl. 61—42 **4 Claims**



An axially slotted roof shield is supported at its front end on a tunneling machine (or shield) frame. The frame includes a fulcrum support portion inset from said shield slots. One or more fulcrum members are movably supported on said support portion. A tunnel set or the like is anchored in the tunnel rearwardly of the frame. The fulcrum member(s) is initially positioned forwardly on its support. Elongated support poles are inserted from below the shield upwardly and forwardly through the slots. The forward portions of the poles extend into or under ground ahead of the shield. Intermediate portions of the poles rest on the fulcrum member(s). The rear portions of the poles underlie the tunnel set. The fulcrum member(s) is tied to the tunnel set so that it is axially fixed during forward movement of the frame.

3,640,078

DEVICES AND METHODS OF CONNECTING TWO INHABITABLE ENCLOSURES UNDER WATER

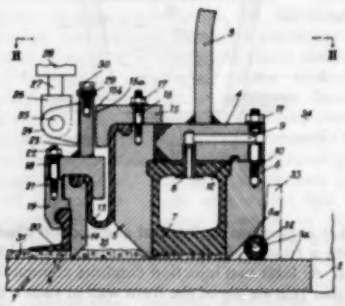
Francisco M. Serrano, Paris, France, assignor to Compagnie Francaise Des Petroles, Societe Anonyme, Paris, France

Filed June 4, 1970, Ser. No. 43,522

Claims priority, application France, June 11, 1969, 6919307/69

Int. Cl. B63c *11/34*

U.S. Cl. 61—69 A **8 Claims**



Apparatus for connecting two underwater inhabitable enclosures at atmospheric pressure, one of them being mobile and the other being anchored on the ocean bottom. The ap-

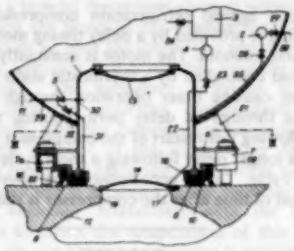
paratus eliminates leakage caused by the presence of marine concretions on the outer surface of the anchored enclosure. The mobile enclosure comprises a pipe whose open end, having a sealing joint on its periphery, is applied around the opening of the fixed enclosure. The pumping of water from the pipe creates a pressure differential which forces the mobile enclosure into tight engagement with the anchored enclosure. At the periphery of the pipe, the mobile enclosure further comprises an annular chamber defined by two circular knives connected by a flexible membrane, one of the knives having a lip joint on its outer side, and the other having an inflatable joint on its inner side, with a third circular knife positioned within the inflatable joint.

3,640,079

METHOD AND APPARATUS FOR CONNECTING TWO SUBMERGED INHABITABLE ENCLOSURES

Louis G. Le Therisien, and Henri A. Marion, both of Paris, France, assignors to Compagnie Francaise des Petroles, Societe Anonyme, Paris, France

Filed Feb. 16, 1970, Ser. No. 11,602
Claims priority, application France, Feb. 14, 1969, 6903654
Int. Cl. B63c *11/34*
U.S. Cl. 61—69 **18 Claims**



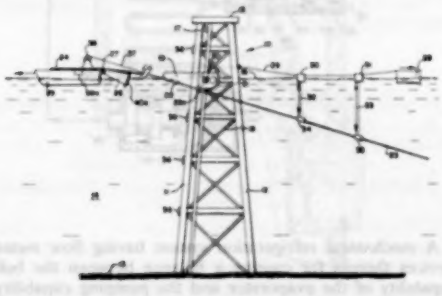
A method and apparatus for connecting two submerged enclosures one fixed and one mobile wherein the mobile enclosure has a tubular passageway, the outside end of which has an inflatable joint and a lip joint for connecting in sealing engagement, the tubular passageway of the mobile enclosure with an opening in the fixed enclosure.

3,640,080

METHOD AND APPARATUS FOR CONNECTING A FLOWLINE TO AN OFFSHORE INSTALLATION

William J. Neal, Manvel, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Mar. 5, 1970, Ser. No. 16,794
Int. Cl. F16l *1/00*; B21d *11/02*
U.S. Cl. 61—72.3 **11 Claims**



A method and apparatus for connecting a flowline having a major portion adapted to lie along the floor of a body of water to an offshore installation of the type having a substantially vertical support positioned on the floor of a body of water and a platform carried by the support. The flowline is positioned at the water surface adjacent the installation and terminated a distance beyond the installation approximately equal to the depth of the water. The portion of the flowline adjacent the installation is slidably connected to the support and the flowline is lowered to the floor of the body of water while gradually bending the flowline in such a manner that the portion of the flowline between the support and its terminal end is substantially parallel to the support when the flowline reaches the floor of the body of water. The terminal end of the flowline is subsequently connected to the platform. In this manner, the flowline has a sufficient curvature to prevent buckling thereof.

3,640,081

HOLLOW SPHERICAL ICE BODIES AND METHOD OF MAKING THE SAME

Edward H. Hadden, Granby, Conn., assignor to Olin Mathieson Chemical Corporation

Filed Apr. 2, 1969, Ser. No. 812,782
Int. Cl. F25c *1/10*
U.S. Cl. 62—1 **11 Claims**

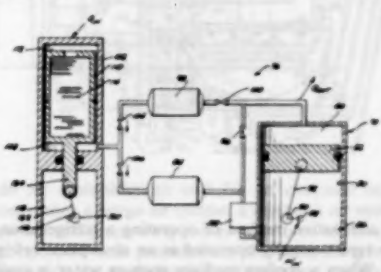
A hollow body of ice for use as a target, the ice body being sufficiently frangible to shatter when struck by a fired pellet. A method of making the hollow ice bodies comprising introducing a measure of water into a mold cavity so as to cover substantially the entire surface of the mold cavity with water. The water is then cooled to a temperature below its freezing point to form a thin shell of ice adjacent to the mold cavity surface. The mold is then opened and the shell of ice is removed from the mold cavity.

3,640,082

CRYOGENIC REFRIGERATOR CYCLE

Axel G. Dehne, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 8, 1970, Ser. No. 44,303
Int. Cl. F25b *9/00*
U.S. Cl. 62—6 **8 Claims**



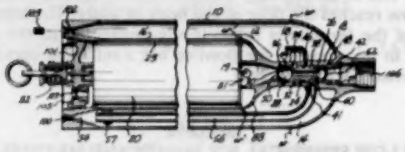
Where a cryogenic refrigerator cycle incorporates pistons operating between a plenum and the working volume and the plenum pressure is controlled to control the loading on the plenum side of the pistons, short time increased refrigerator capacity is obtained for cooldown by bleeding fluid from the plenum into the working volume.

3,640,083

GENERATOR OF COOL WORKING GASES

Lyle D. Galbraith, Redmond, and William F. Thorn, Mercer Island, both of Wash., assignors to Rocket Research Corporation, Redmond, Wash.

Filed Mar. 27, 1970, Ser. No. 23,154
Int. Cl. F17c 7/02
U.S. Cl. 62—52 26 Claims



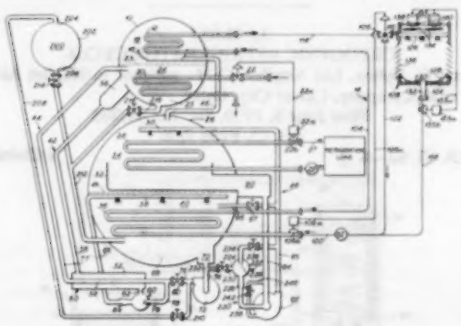
Hot pressure gases are generated by burning a solid fuel grain. A portion of the gases are used to pressure feed a liquid from its storage chamber into a mixing zone. The remainder of the hot gases are directed into the mixing zone for mixing with the liquid. The hot gases provide the heat of vaporization for, and cause the vaporization of, the liquid. The gas generator comprises a one-piece housing of composite welded construction, defining liquid storage, breech and mixing chambers. A control cartridge containing burst discs, flow control orifices and seals is inserted into the housing through the outlet passageway. A solid fuel cartridge is inserted into the breech through an opening at the opposite end of the housing.

3,640,084

REFRIGERATION SYSTEM AND METHOD

Neil E. Hopkins, York, Pa., and Paul W. Muench, Medford Lakes, N.J., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 24, 1970, Ser. No. 66,260
Int. Cl. F25b 15/06
U.S. Cl. 62—101 14 Claims



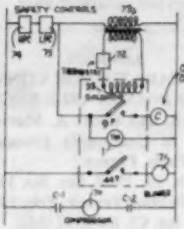
An alternative method of operating a refrigeration system of the type normally operated in an absorption refrigeration cycle. When a cooling medium such as water is available at temperatures below a chilled fluid temperature which will satisfy the refrigeration load, the absorption refrigeration cycle is suspended, the supply of heat to the generator being discontinued, and the absorber is operated as a condenser to liquefy the refrigerant vaporized in the evaporator. Means are provided for operating the system in such a manner.

3,640,085

REFRIGERATION SYSTEM WITH DELAY TIMING MECHANISM

John L. Harris, Delafield, Wis., assignor to Deltrol Corp., Bellwood, Ill.

Original application Aug. 14, 1969, Ser. No. 849,961, now Patent No. 3,598,214, dated Aug. 10, 1971. Divided and this application Apr. 12, 1971, Ser. No. 133,038
Int. Cl. F25b 19/00
U.S. Cl. 62—158 9 Claims



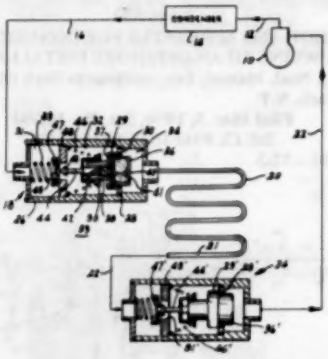
Protection against refrigeration compressor burnout by short cycling is provided by a delay timing mechanism having a motor and solenoid. The motor is constantly energized and the solenoid controlled by a thermostat stalls or releases the mechanism causing timer operation through its cycle. The timer runs through its delay period during the normal off period, allowing fast restart of the compressor. Also the timer provides a longer delay following a short cycle then following a normal cycle. This is accomplished by operating the timer for a period of time after the compressor is started.

3,640,086

REFRIGERANT FLOW CONTROL EMPLOYING PLURAL VALVES

Herbert M. Brody, Columbus, Ohio, assignor to American Standard Inc., New York, N.Y.

Filed Feb. 27, 1970, Ser. No. 15,160
Int. Cl. F25b 41/00
U.S. Cl. 62—210 9 Claims



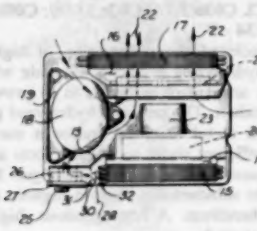
A mechanical refrigeration system having flow metering devices therein for causing a balance between the boiling capability of the evaporator and the pumping capability of the compressor, whereby the system is adapted for air conditioner usage subject to varying evaporator heat loads and varying condenser coolant action.

3,640,087

FROST-ANTICIPATING BIMETAL CONTROL FOR AN AIR CONDITIONER

Bobby G. Harrison, Evansville, and Charles D. Esche, Newburgh, both of Ind., assignors to Whirlpool Corporation

Filed May 8, 1970, Ser. No. 35,611
Int. Cl. F25b *1/00*
U.S. Cl. 62—227 9 Claims



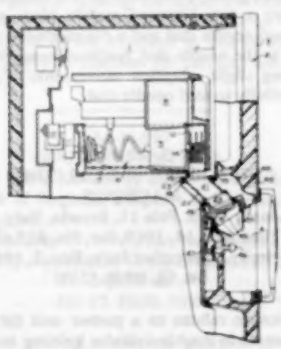
An air conditioner for cooling room air having a separate electrical apparatus compartment within the air conditioner housing completely enclosing a temperature responsive device such as a bimetal thermostat element within the compartment. Means are provided for establishing a subsidiary flow path for room air over the thermostat and separate from the main room airstream that is directed over the air conditioner evaporator. The subsidiary airstream is directed through the electrical apparatus compartment in heat exchange relation with the temperature-responsive device and then to the exterior of the room rather than being returned to the room. In a preferred embodiment an end portion of the evaporator is arranged in the subsidiary air flow path in heat exchange relationship with the subsidiary airstream so as to effect the temperature of this air. Frost buildup on the air conditioner evaporator is anticipated by a lowering evaporator temperature which is reflected at the unit thermostat as a result of room air passing over the end portion of the evaporator in its passage to the thermostat.

3,640,088

HOUSEHOLD REFRIGERATOR INCLUDING EXTERIOR ICE SERVICE

Dwight W. Jacobus, and Michael L. Simms, both of Louisville, Ky., assignors to General Electric Company

Filed June 3, 1970, Ser. No. 43,104
Int. Cl. F25c *5/18*
U.S. Cl. 62—320 6 Claims



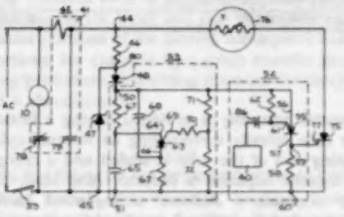
A refrigerator including an ice dispenser and crusher in a freezer compartment and an ice delivery passage through the refrigerator door for delivering ice exterior of the cabinet. The passage includes a normally closed closure member and a heater and is so constructed and arranged within the door as to maintain the various portions of the passage at temperatures preventing the accumulation of ice slush and water in the passage and the freezing of the closure member.

3,640,089

HOUSEHOLD REFRIGERATOR WITH EXTERIOR ICE SERVICE

Lauren L. Frazier, Louisville, Ky., assignor to General Electric Company

Filed June 8, 1970, Ser. No. 44,271
Int. Cl. H03k *17/56*; G08b *13/00*
U.S. Cl. 62—320 10 Claims



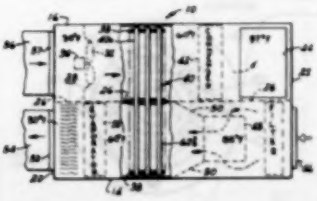
A refrigerator including a freezer compartment containing a combination ice dispenser and crusher, a passage for conveying ice from the crusher outlet exteriorly of the refrigerator and exterior means for operating the dispenser and crusher is provided with safety means for stopping operation of the dispenser and crusher upon the thrusting of an arm or other elongated member into the passage. This safety means comprises a proximity detection circuit including a sensing plate associated with the ice passage.

3,640,090

COLD-HEAT RECOVERY FOR AIR CONDITIONING

Roland A. Ares, Wilmington, N.C., assignor to American Standard Inc., New York, N.Y.

Filed June 3, 1970, Ser. No. 42,972
Int. Cl. F25d *17/02*
U.S. Cl. 62—436 7 Claims



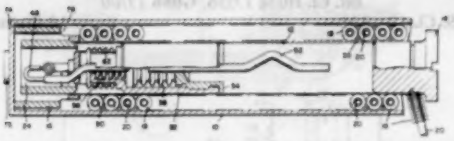
A cold air replenishment unit for an enclosed building space comprising a purge air system, a replenish air system, a heat pipe assembly spanning the two systems to simultaneously provide cold-heat potential transfer from the purge air to the replenish air, a mechanical refrigeration system comprising the commonly known cycle components, having an air-over fin tube evaporator located downstream of the replenish air heat pipe section, and having an air-over fin tube condenser located upstream of the purge air heat pipe section, all systems jointly forming a cold-heat recovery apparatus.

3,640,091

VALVE ARRANGEMENT TO PROVIDE TEMPERATURE LEVEL CONTROL AT CRYOGENIC TEMPERATURE RANGES

Joseph S. Buller; Michael J. Nagy, and Eugene W. Peterson, all of Santa Barbara, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed May 13, 1969, Ser. No. 824,177
Int. Cl. F25b *19/00*
U.S. Cl. 62—514 3 Claims



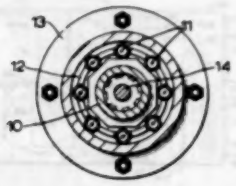
A cryostat assembly is provided having a finned cryogen delivery tube spirally surrounding an internal cylinder. The terminating end of the tube is sealed and a cryogen escape port is located adjacent a detector heat load. The central cylinder contains a bellows arrangement having sealed therein the cryogen utilized in the delivery tube, or other suitable fluid. The bellows has attached thereto a needlepointed element having its needlepoint in operative relationship with the escape port in the delivery tube. Spring means normally bias the element to bring the needlepoint into closed relationship with the port. As ambient temperature varies, the fluid within the bellows expands and contracts, moving the needlepoint into and out of sealing relationship with the port thereby accomplishing bleeding feed of the cryogen from the delivery tube, the expansion of which into the lower pressured area induces cooling of the detector by virtue of what is known as the Joule-Thomson effect.

3,640,092

TORQUE LIMITER

Francis John Neal, Brewood; Jerzy Leon Courtenay, and John Richard Simmons, both of Wolverhampton, all of England, assignors to H. M. Hobson Limited, London, England

Filed July 10, 1970, Ser. No. 53,927
Int. Cl. F16d *7/06*
U.S. Cl. 64—28 3 Claims



A torque limiter for limiting the torque which can be applied by an input shaft to an output shaft and comprising a fixed outer race, a cage within the race constituting the output member of the limiter, a cam constituting the input member of the limiter and normally operative to drive the cage by cooperation with one or more rollers confined by the cage and a torsion spring connected between the cam and the cage, the spring yielding, when excessive torque is reacted by the driven mechanism, to cause the cam to displace the roller or rollers into locking engagement with the outer race.

3,640,093

PROCESS OF CONVERTING METALORGANIC COMPOUNDS AND HIGH PURITY PRODUCTS OBTAINED THEREFROM

Leon Levene, Toledo, Ohio, and Ian M. Thomas, Temperance, Mich., assignors to Owens-Illinois, Inc.

Continuation-in-part of application Ser. No. 805,841, Mar. 10, 1969, now abandoned. This application July 22, 1969, Ser. No. 843,777
Int. Cl. C03b *5/16*; C03c *13/00*; C08h *1/34*
U.S. Cl. 65—134 30 Claims

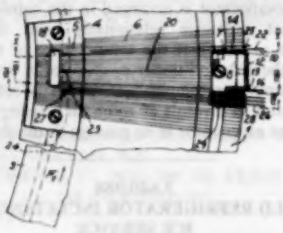
There is disclosed the preparation of high purity oxide products by hydrolyzing a silicon alkoxide with less than a stoichiometric amount of water so as to provide a partially hydrolyzed product. The partially hydrolyzed product is then reacted with a metal alkoxide and/or a metal salt in the presence of sufficient water to initially form a clear solution which subsequently converts to a clear gel. The gel is then heated so as to substantially remove organic and free liquid components therefrom. A homogeneous, high purity oxide product is recovered.

3,640,094

DEVICE FOR CUTTING AND GRIPPING THREADS IN CIRCULAR KNITTING MACHINES AND THE LIKE

Francesco Piana, and Angelo Brega, both of Varese, Italy, assignors to Mecmor S.p.A., Milan, Italy

Filed May 6, 1969, Ser. No. 822,149
Claims priority, application Italy, May 6, 1968, 16151 A/68
Int. Cl. D04b *9/06*
U.S. Cl. 66—19 2 Claims



This disclosure relates to a device for cutting and gripping threads in circular knitting machines of the type with a fixed needle cylinder and a fixed needle dial arranged thereon and rotating thread guide units, said device comprising a shears unit including a cam-actuated mobile blade which extends radially to said needle dial and a counterblade which extends tangentially to the needle dial; resilient means being provided for permitting slight adaption movements of said counterblade tangentially to said needle dial.

3,640,095

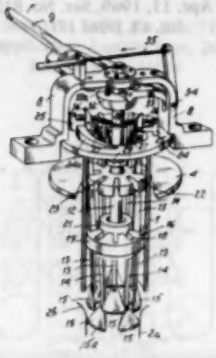
PUSHER UNIT FOR DOUBLE-CYLINDER KNITTING MACHINES

Francesco Lonati, Via S. Polo 11, Brescia, Italy

Filed Apr. 14, 1969, Ser. No. 815,670
Claims priority, application Italy, Dec. 2, 1968, 832246
Int. Cl. D04b *35/00*
U.S. Cl. 66—147 3 Claims

This disclosure relates to a pusher unit for pushing knitwear downwards in double-cylinder knitting machines, which comprises two series of levers of different length arranged about a central shaft to rotate together with the needle cylinders, the lower ends of said levers being bladed, means being provided to cause the vertical sliding and oscillation of the

levers along a closed endless path, the arrangement being such that in working conditions the levers are caused to

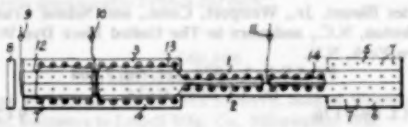


penetrate into the lower cylinder and push the knitwear downwards as it is formed.

3,640,096
KNITTING METHODS

Max William Betts, Coventry, and Frank Robinson, Borrowash, both of England, assignors to Courtaulds Limited, London, England

Filed July 8, 1969, Ser. No. 840,004
Claims priority, application Great Britain, July 22, 1968, 34855/68
Int. Cl. D04b 7/04
U.S. Cl. 66—176 **7 Claims**



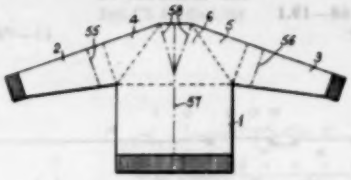
A method of knitting a jersey-type garment on a flat bar knitting machine of the kind comprising at least two pairs of opposed needle beds extending generally parallel to each other, the beds of one pair being laterally movable relative to the beds of the other pair, said method comprising tubular knitting two sleeve portions and a body portion united by a fourth tubular portion forming the upper portion of the jersey and fashioning the fourth tubular portion in Wales which are an extension of or are intended to extend into the body portion of the jersey. A machine for carrying out the method is also claimed.

3,640,097
KNITTING METHOD

Max William Betts, Coventry, and Frank Robinson, Borrowash, both of England, assignors to Courtaulds Limited, London, England

Filed July 17, 1969, Ser. No. 842,512
Claims priority, application Great Britain, July 22, 1968, 34,853/68
Int. Cl. D04b 7/00
U.S. Cl. 66—176 **4 Claims**

A method of making a sleeved garment on a knitting machine, the method including the steps of knitting a shoulder portion of each sleeve, in the direction towards the upper end of the sleeve, in reciprocatory manner on both beds of a pair of opposed beds of the machine, so that the pieces of fabric of each shoulder portion on opposite beds are continuous at the edge of the shoulder portion outermost on the machine and in the finished garment, knitting the body of the garment commencing at the lower end and knitting front and rear upper body portions of the garment as

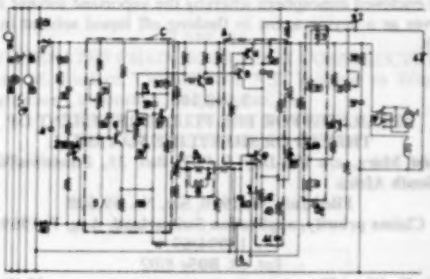


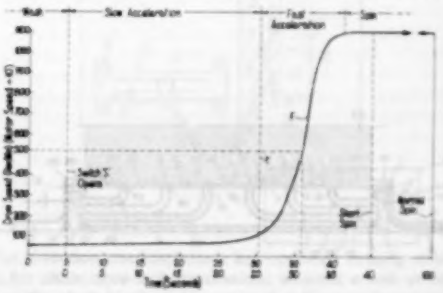
flat fabric on different beds of a pair of opposed beds of the machine and joining the front and rear upper body portions to the shoulder portions of the sleeves subsequent to knitting of these portions, for example by a stitch transfer procedure or a stitching procedure. A knitting machine for carrying out the method is also claimed.

3,640,098
CLOTHES-WASHING AND SPIN-DRYING MACHINES

Martin Harold Eastall, Peterborough, England, assignor to British Domestics Appliances Limited, Peterborough, England

Filed June 19, 1969, Ser. No. 834,686
Claims priority, application Great Britain, June 20, 1968, 29,412/68
Int. Cl. D06f 33/00
U.S. Cl. 68—12 R **11 Claims**





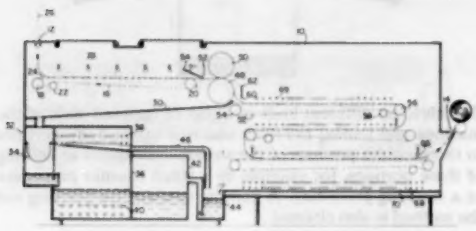
A clothes-washing and spin-drying machine having a drum rotatable about a nonvertical axis at a relatively slow speed for washing and at a much higher speed for spin drying, including control means for accelerating the driving motor, and hence the drum, relatively slowly through a speed at which the centrifugal force on the clothes within the drum equals the force due to gravity, to produce a uniform distribution of the clothes within the drum, and subsequently more rapidly towards the spin-drying speed.

3,640,099

APPARATUS FOR CONTINUOUSLY SCOURING WEBS OF KNIT MATERIAL OR THE LIKE

William J. Holm, Springfield, Vt., assignor to Riggs & Lombard, Inc., Lowell, Mass.

Filed Dec. 2, 1969, Ser. No. 881,497
Int. Cl. B05c 3/132
U.S. Cl. 68—19.1 4 Claims



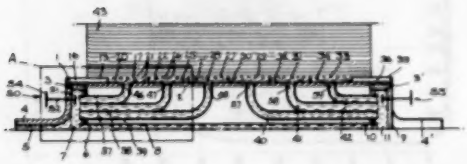
A running web of easily stretchable material such as knit goods or the like is solvent scoured on a continuous basis by means of a plurality of conveyor belts which deliver the web from a solvent spray station in an enclosure through a drying stage, the longitudinal tension in the fabric itself being employed to control the speed of the conveyors. The web is transferred from one conveyor to the next in a relaxed condition and in the drying stage steam coils are employed to heat the enclosed atmosphere whereby the vaporized solvent itself serves as a drying agent in flashing off liquid solvent in the web.

3,640,100

APPARATUS FOR THE FLUID TREATMENT OF THREAD OR SHEETLIKE MATERIAL

Horst Marz, c/o PM-Duy 5 P.O. Box 31, Pinetown/Natal, South Africa

Filed July 30, 1970, Ser. No. 59,608
Claims priority, application Switzerland, Aug. 7, 1969, 11994/69
Int. Cl. B05c 8/02
U.S. Cl. 68—150 13 Claims



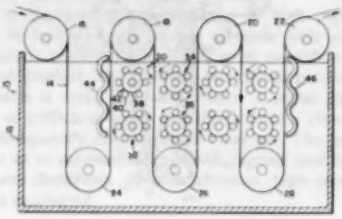
A drum rotatable about its longitudinal axis is equipped with an outer perforated jacket, the space between the drum and jacket being divided into separate chambers and means for supplying fluid to the chambers whereby the fluid will pass through the perforations to contact thread or sheet material wound on the jacket by reason of centrifugal force, pumping pressure, or both.

3,640,101

CONTINUOUS OPEN WIDTH WASHER

Harold R. Wilcox, Maynard, Mass., assignor to Riggs & Lombard, Inc., Lowell, Mass.

Filed Apr. 11, 1969, Ser. No. 815,329
Int. Cl. D06f 17/10
U.S. Cl. 68—175 10 Claims



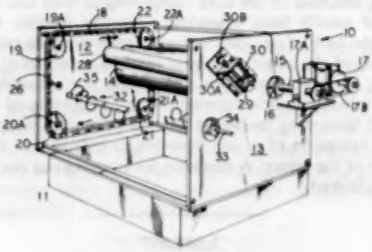
An apparatus is provided for the continuous washing of a running open width textile web. Idler and driven rolls guide the web in and out of a tank containing washing liquid so that the web follows a plurality of spaced parallel paths. Mounted in the tank below the liquid level are rotary impellers located on opposite sides of the web adjacent to the web paths. The impellers are separately driven and, when rotated, deliver pulses of liquid against opposite sides of the web providing a highly agitated washing action independent of the speed of the web.

3,640,102

WINCH APPARATUS FOR TREATING MATERIAL IN STRAND FORM

Charles Blount, Jr., Westport, Conn., and Nelson Crandall, Edenton, N.C., assignors to The United Piece Dye Works, New York, N.Y.

Filed Feb. 2, 1970, Ser. No. 7,604
Int. Cl. B05c 3/134
U.S. Cl. 68—176 9 Claims



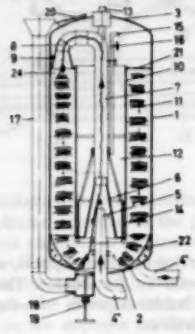
This disclosure is directed to an apparatus for treating material in a strand or ropelike form. The apparatus includes a bath means for containing a treating fluid and a supporting roller for the strand material spaced thereabove. Winding means in the form of an endless conveyor to which one end of the strand material and a cooperating guide roller are operatively associated with the support roller whereby in operation the strand material is successively unwound at its trailing end and rewound at its leading end about the supporting roller as the intermediate convolution is successively drawn through the treating bath.

3,640,103

APPARATUS FOR TREATING TEXTILES

Friedrich Richter, Zofingen, and Rudolf Steiner, Roggwil, both of Switzerland, assignors to Scholl AG, Zonfingen, Switzerland

Filed Sept. 14, 1970, Ser. No. 71,940
Claims priority, application Austria, Sept. 26, 1969, 9109/69
Int. Cl. B05c 3/134
U.S. Cl. 68—177 2 Claims



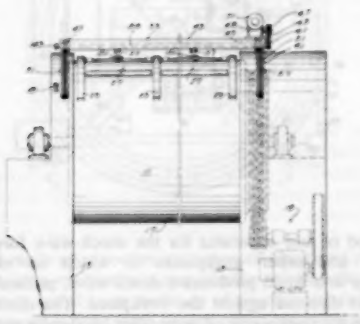
An apparatus for treating textiles in the form of endless ropes or tubes, comprising a container with a central rising pipe and an annular chamber surrounding it, the processing liquor being kept in circulation all through the container and the rope propelled through the rising pipe by means of an injection effect. The rising pipe takes the form of a positioning pipe which rotates or pivots backwards and forwards and during its rotating or pivoting movements brushes across the upper orifice of the annular chamber and lays out the rope conveyed through the positioning tube in loops in the annular chamber. The lower end of the rising pipe is surrounded by an axially displaceable cylindrical port.

3,640,104

MECHANIZED DOOR

William C. Lutzen, and Edward J. Berry, both of Wauwatosa, Wis., assignors to Ludell Mfg. Co., Milwaukee, Wis.

Filed Mar. 30, 1970, Ser. No. 23,793
Int. Cl. D06f 37/28
U.S. Cl. 68—210 10 Claims



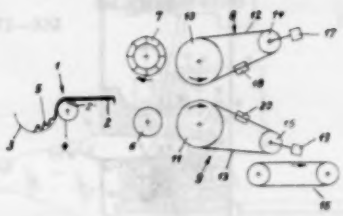
Disclosed herein is a washing machine comprising a frame, a washing drum rotatably mounted on the frame and having a circumferentially extending opening, a door mounted on the drum for movement relative to a first position closing the opening and a second open position clear of the opening, and mechanical means movably mounted on the frame for displacing the door between its open and closed positions.

3,640,105

APPARATUS FOR PROCESSING TANNED HIDES

Gerhard Richter, and Norbert Schmid, both of 84 Regensburg, Regensburg 13, Germany

Filed Dec. 19, 1969, Ser. No. 886,675
Claims priority, application Germany, Dec. 28, 1968, P 18 173 65.4
Int. Cl. C14b 1/08
U.S. Cl. 69—41 7 Claims



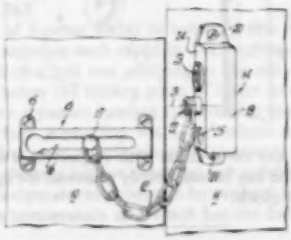
A machine for wringing tanned hides of the kind including a spreading device and a wringing device, has the spreading device situated near the feed-in end of the machine and the wringing device situated near the delivery end of the machine. A hide-feeding device is provided which, in operation, is moved towards the wringing device to feed a hide into the wringing device, and when the hide is held by the wringing device is moved back again ready to receive a subsequent hide, the feeding device, the spreading device and wringing device being arranged to cooperate together in such a way that an entire hide is wrung in one pass through the machine.

3,640,106

KEY-OPERATED CHAIN DOOR-LOCK CONSTRUCTION

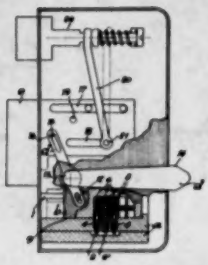
Eugene M. Lorincz, Cinnaminson, N.J., assignor to Wessel Hardware Corporation, Philadelphia, Pa.

Filed Oct. 12, 1970, Ser. No. 79,838
Int. Cl. E05b 65/06; E05c 17/36
U.S. Cl. 70—93 14 Claims



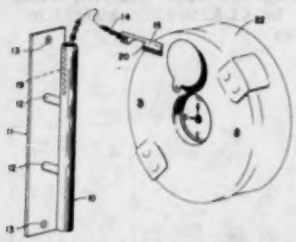
The invention contemplates a key-operated housing structure for chain door-lock mechanism, wherein a bolt at one end of the chain is releasably retained, subject to the control of the key. The bolt is enterable in a bore in the housing, and before reaching the home position, a recess in the bolt is dogged to a spring, which is otherwise normally in the path of movement of the inserted bolt. The key-operated means is directly engageable with the spring to relieve the dogged engagement of the bolt, and means coating between the spring and the housing assures that unauthorized attempted removal of the bolt will not impair the normal spring suspension and action.

3,640,107
KEY-CONTROLLED LOCKS
Noel Litvin, Buenos Aires, Argentina, assignor to Abraham Isaac Scherz, a part interest
Filed Dec. 8, 1969, Ser. No. 886,211
Claims priority, application Argentina, Sept. 24, 1969, 224,306
Int. Cl. E05b *63/08, 19/14*
U.S. Cl. 70—129 12 Claims



A key-operated combination lock having a locking latch operated by a pivotable handle. Movably secured to the handle is a slidable bolt control element which constitutes the main closing element. The bolt control element is locked by the penetration of a number of bolt pins through the bolt control element and into perforations which house drive pins of varied sizes in a fixed base. The bolt control element may only be moved after the insertion of a key having a plurality of grooves which coincide with the drive pins into the keyway between the clasp and the fixed frame.

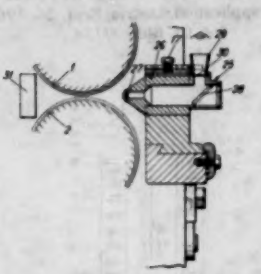
3,640,108
MODEL 'C' WATCHCLOCK KEYHOLDER
Robert H. Cairns, 370 East St., Wrentham, Mass.
Filed Aug. 13, 1970, Ser. No. 63,476
Int. Cl. A47g *29/10*
U.S. Cl. 70—456 R 4 Claims



A captive key on a chain with respect to a storage tube from which the key is temporarily removed for application to a watchman's clock.

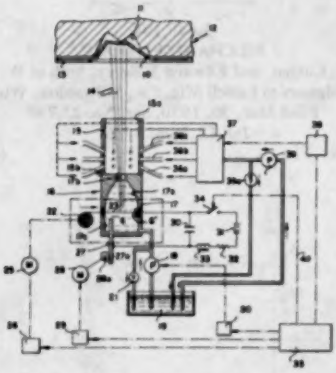
3,640,109
METHODS OF AND APPARATUS FOR SETTING ROLLER GUIDES IN ROD MILLS
George Walker Ashton, Totley, Sheffield, and John Congreve Ashton, Sheffield, both of England, assignors to Ashlow Steel & Engineering Company Limited, Sheffield, England and Templeborough Rolling Mills Limited, Rotherham, England
Filed Apr. 14, 1969, Ser. No. 815,583
Claims priority, application Great Britain, Apr. 23, 1968, 19,221/68
Int. Cl. B21c *51/00;* B21b *39/20;* B21d *43/16*
U.S. Cl. 72—37 7 Claims

In the setting of the guide rollers of a rolling stand in a rod-rolling mill use is made of an optical device instead of the human eye. The optical device and a holder for the guide rollers are made interchangeable in a support for the holder. The support and the rolls in the stand are adjusted in position



while the optical device is in the support, and then the optical device is replaced by the holder. The position of the guide rollers in the holder is preset with the use of the same or another optical device.

3,640,110
SHOCK FORMING
Kiyoshi Inoue, 100 Sakato, Kawasaki, Kanagawa, Tokyo, Japan
Continuation-in-part of application Ser. No. 735,760, June 10, 1968, now Patent No. 3,566,647. This application Aug. 14, 1969, Ser. No. 850,056; Oct. 11, 1968, 43/73973; 43/73974; June 10, 1969, 44/45531; 44/45532; Jan. 31, 1969, 44/8455
Int. Cl. B21d *26/12*
U.S. Cl. 72—56 49 Claims



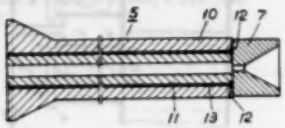
Method of and apparatus for the shock-wave forming of metallic and other workpieces in which an electrical discharge in a liquid produces a shock wave, preferably in a power jet directed against the workpiece. The discharge is produced between a pair of permanent electrodes with a gap between them temporarily bridged at least in part by a fusible conductor. The electrical supply preferably includes at least one high-voltage, low-current source for initiating the discharge and at least one high-current, low-voltage source for sustaining the discharge thereafter. Control of the power jet is effected by fluidic methods using transverse jets of the same or another fluid, preferably under the control of a programmer.

3,640,111

PRESS FOR HYDROSTATIC EXTRUSION HAVING A COMPOSITE CYLINDER EXTERNALLY EXCUSED TO HIGH PRESSURE

Hans Lundstrom, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Feb. 16, 1970, Ser. No. 11,479
Claims priority, application Sweden, Feb. 14, 1969, 2024/69
Int. Cl. B21c *27/00*
U.S. Cl. 72—60 **5 Claims**



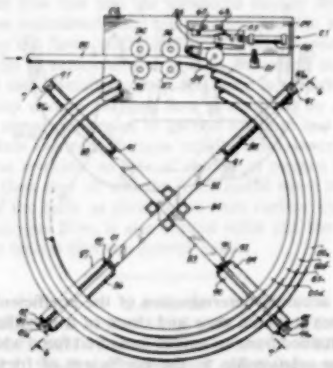
A press for hydrostatic extrusion includes a press stand and a high-pressure cylinder arranged in the press stand. These parts form a pressure chamber to enclose a pressure medium, and a piston is provided extending into the chamber for effecting a pressure in the enclosed pressure medium. A tubular element having a die at its inner end projects into the pressure chamber on the opposite end from the piston. The tubular element is formed of a number of tubes arranged one inside the other between which is an annular gap when the tubular element is unloaded; but the tubes come into contact when the outer part is subjected to working pressure.

3,640,112

COILING METHOD AND APPARATUS

Herbert J. Meyfarth, Cleveland, Ohio, and John J. Crosby, Cambria Heights, N.Y., assignors to Republic Steel Corporation, Cleveland, Ohio

Filed May 12, 1969, Ser. No. 823,764
Int. Cl. B21f *3/10*; **B21c** *47/00*
U.S. Cl. 72—138 **14 Claims**



A coil made of a continuous piece of elongated material such as tubing, prebent into pancakelike spirals called radial layers, each radial layer made up of several concentric and coplanar convolutions, with several radial layers stacked axially, and method and apparatus for making such coils.

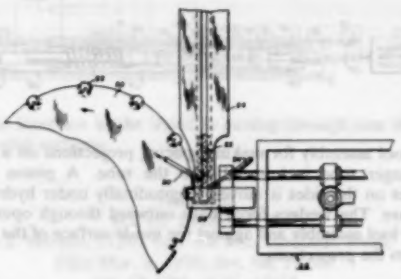
The material is bent prior to coiling at predetermined bending radii which are different for different convolutions within a radial layer. One or more of the convolutions within each radial layer may be bent at constant bending radius; the rest may be bent at gradually changing radii. The bending radius is controlled by an electric and hydraulic network employing both timed and feedback controls. The coil may be built either upwardly, with the most recently made radial layer always at the bottom of the coil, or it can be built downwardly, with the most recently made radial layer always on the top of the coil.

3,640,113

APPARATUS FOR PROCESSING TRANSISTOR LEADS

Martin G. Heller, Warren St., West Orange, N.J., and Donald D. Kelly, 19 Mitchell Ave., Roseland, N.J., said Kelly assignor to said Heller

Filed Feb. 3, 1970, Ser. No. 8,192
Int. Cl. B21f *45/00*
U.S. Cl. 72—332 **15 Claims**



In an apparatus for processing transistor leads as in U.S. Pat. No. 3,396,758 to R. L. Hall on Aug. 13th, 1968 there is provided improvements in the transporting wheel and in the cutting and shaping die mechanism used to automatically cut and shape the leads of transistors. There is also provided improvements in maintaining the alignment and orientation of the transistors as they are fed from a discharge chute to the transporting wheel.

3,640,114

METHOD OF HOT ROLLING METAL

William R. Foley, Jr., Allison Park, Pa., assignor to Teledyne, Inc., Los Angeles, Calif.

Continuation of application Ser. No. 656,365, July 27, 1967, now abandoned. This application June 23, 1969, Ser. No. 835,809
Int. Cl. B21b *1/00*
U.S. Cl. 72—365 **6 Claims**

In the art of moving metal at hot forgeable temperature through and reducing such metal in a hot rolling mill, engaging the metal by a roll and applying to the roll coolant at a temperature below the boiling point of water so that the roll is subjected to repeated heating and cooling cycles, the roll having a surface contacting the metal which surface is of chromium alloy steel which has simultaneously exceptional resistance to thermal fatigue cracking and good resistance to wear at the temperatures produced by contact with metal at hot forgeable temperature and which has the following composition:

Element	Broad range (%)	Narrow range (%)	Preferred (%)
Carbon	0.03–0.2	0.05–0.2	about 0.15
Chromium	3–8	4.5–6	about 5
Molybdenum	0–2	.5–1.5	about 1
Tungsten	0–7	.5–4	about 1.5
Vanadium	0–1	0–0.5	about 0
Manganese	.3–3	.3–2.5	about 2
Silicon	.2–2	.2–2	about 1

the sum of the percentages of the chromium, molybdenum, tungsten and vanadium being between about 4 and about 9, the balance being substantially iron. The roll may comprise a ferrous metal body to which the metal contacting surface of chromium alloy steel is applied. The metal contacting surface may be and preferably is applied to the roll body by weld

deposition. The metal moved through the rolling mill is preferably iron or steel above its critical temperature.

3,640,115

TUBE SPACER TOOL

Richard D. Duncan, and George H. Salzano, both of Richland, Wash., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 19, 1969, Ser. No. 886,632
Int. Cl. B21d *41/02*; B21b
U.S. Cl. 72—393 **2 Claims**

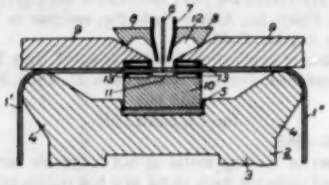
A tool assembly for making spacing projections on a heat exchanger tube is inserted into the tube. A piston with wedges on the sides is moved longitudinally under hydraulic pressure. The wedges force balls outward through openings in the tool assembly and against the inside surface of the tube to form the projections.

3,640,116

MANDREL FOR USE IN MANUFACTURING A HOLLOW ELONGATED THIN-WALLED METALLIC BODY AND METHOD OF USING SUCH MANDREL

Erik Hellman, Irsta, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Original application June 3, 1968, Ser. No. 734,061, now Patent No. 3,559,278. Divided and this application June 15, 1970, Ser. No. 46,344
Int. Cl. B23k *31/02*
U.S. Cl. 72—476 **3 Claims**



A hollow, elongated, thin-walled body is formed by welding at least one seam to close the body around a mandrel of a material having a greater coefficient of thermal expansion than the material of the body, whereafter the body and mandrel are heated until the thermal stresses in the body are greater than the yield strength of the material of the body.

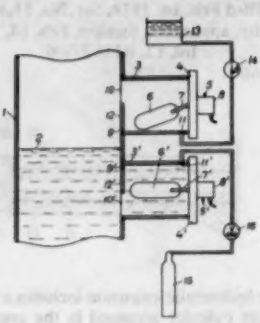
3,640,117

LEVEL CONTROL MEANS

Jens Ole Stilling, Lakemba, Australia, assignor to Aktiebolaget Asea-Atom, Vasteras, Sweden

Filed Sept. 21, 1970, Ser. No. 73,803
Claims priority, application Sweden, Sept. 26, 1969, 13246/69
Int. Cl. G01l *25/00*
U.S. Cl. 73—1 R **3 Claims**

A liquid level indicator has a level monitor arranged in a chamber adapted to be connected in parallel with a container for the liquid whose level is to be indicated. An artificial liquid level is formed in the chamber by introducing liquid or gas depending on whether the indicator is intended to indicate a too high or too low liquid level. The liquid or gas



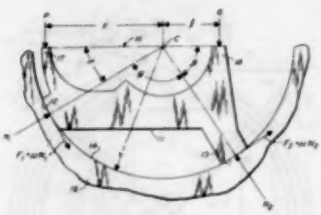
used is allowed to escape into the container, thereby testing the level monitor even when it is part of an operating system.

3,640,118

FRICTION-TESTING APPARATUS AND METHODS

David G. Geis, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Mar. 9, 1970, Ser. No. 17,664
Int. Cl. G01n *19/02*
U.S. Cl. 73—9 **7 Claims**



A more accurate determination of the coefficient of friction between a clutch shoe and drum of a metallic friction clutch is attained from an output measured force which bears a nonlinear relationship to the coefficient of friction. The output force is obtained by (1) applying an input predetermined force on one side of the clutch shoe, which has a pair of bearing surfaces engaging the drum, (2) applying a aiding torque to the drum, and (3) measuring the force transmitted to the opposite side of the clutch shoe. Alternatively, a friction-measuring device of general application utilizes a fixture for holding a pair of samples of a first material in engagement with an arcuate surface of a second material to which a predetermined input force and torque are applied while the fixture is restrained from movement to produce an output reactive force on the holder from which the coefficient of friction between the two materials may be computed by the solution of three simultaneous equilibrium equations of the forces on the materials.

3,640,119

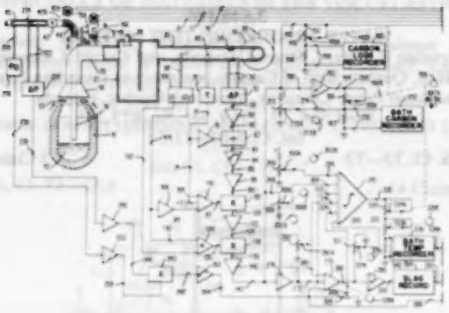
CARBON CONTENT MEASUREMENT IN A BASIC OXYGEN FURNACE

Bernard Blum, Buffalo, N.Y., and John W. Schwartzenberg, Maple Glen, Pa., assignors to Leeds & Northrup Company, Philadelphia, Pa.

Original application Feb. 14, 1966, Ser. No. 534,617, now Patent No. 3,528,800, dated Sept. 15, 1970, which is a continuation-in-part of application Ser. No. 479,867, Aug. 16, 1965, now abandoned. Divided and this application May 6, 1970, Ser. No. 34,936

Int. Cl. G01n *31/00*; C21c *5/00*

U.S. Cl. 73—23 **5 Claims**



A system for controlling the operation of a basic oxygen furnace in response to measurements of the carbon loss through the exhaust gases and the oxygen flow rate to the lance. The carbon content of the bath as determined from the carbon loss rate and the measured oxygen flow rate as well as the calculated bath temperature provide a basis for controlling the furnace. Oxygen flow is maintained constant until silicon is removed and is then increased at a steady maximum rate. Simultaneously, the lance is brought down as slag buildup occurs. Oxygen flow is modified by a positive feedback signal responsive to carbon loss rate and is limited when carbon loss rate changes rapidly. Also, lance height is modified in response to rate of change of oxygen flow. The oxygen is then shut off and the lance raised when the carbon content of the bath, as determined from carbon loss rate divided by oxygen flow, is at a desired value and the temperature of the bath is also at a desired value.

3,640,120

METHOD AND APPARATUS FOR DETECTING AN INTERFACE BETWEEN TWO LIQUIDS IN A PIPELINE

Hendrikus J. Nihof, and Albertus C. H. Borsboom, both of Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

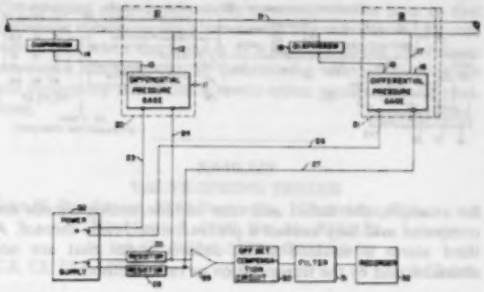
Filed Aug. 7, 1969, Ser. No. 848,155

Claims priority, application Netherlands, Aug. 16, 1968, 6811659

Int. Cl. G01n *9/26*

U.S. Cl. 73—53 **3 Claims**

Detecting a change in the composition of a liquid which is being transported through a pipeline, characterized in that the pressure drop is measured simultaneously across two spaced-apart measuring sections in the pipeline. At least one measuring section is horizontal or has a rising slope in the direction of flow. The results of the measurements are compared with each other, if necessary after correction to allow for different circumstances in the measuring sections. A change in the difference between the two results indicates



that an interface in the liquid is passing through one of the measuring sections.

3,640,121

SLUMP INDICATOR

Julian J. Mercier, 11302 East 4th Ave., Spokane, Wash.

Filed Mar. 9, 1970, Ser. No. 17,687

Int. Cl. G01n *9/02, 33/38*

U.S. Cl. 73—54 **3 Claims**

A liquid filled vial pivotally and resiliently mounted is operable to unlock the dial mechanism of the invention in one and only one position as the slump indicator is rotationally carried in a mixing drum and to maintain the indicator in a fixed position and thus maintain the reading throughout the rotational cycle of the drum. Deflector walls are provided on two opposing sides of a sample cage hingedly carried by a strain gauge indicator assembly. The strain gauge indicator assembly comprises a tension plate mounted on a spring and slidably carried in a multiplicity of yokes on a mounting base, a normally locked indicator, a shaft suitably fixed at one of its terminal ends to the tension plate and having a sample cage hingedly carried at the opposite end thereof.

3,640,122

ULTRASONIC DEFECT SIGNAL DISCRIMINATOR

Edward M. Nusbickel, Jr., Allentown, Pa., assignor to Bethlehem Steel Corporation

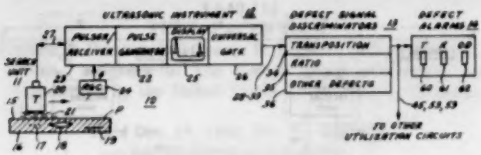
Filed Nov. 20, 1969, Ser. No. 878,482

Int. Cl. G01n *29/00*

U.S. Cl. 73—67.9 **10 Claims**

Ultrasonic instrument with pulsed transducer provides a plurality of gating pulses and analog output signals related to test piece surface spacing and defect characteristics. Separate transposition, ratio, and other defect signal discriminators sample these output signals simultaneously and, by means of logic elements combined with a "strobe" gate, provide for characterizing defects and occurrences of events.

A transposition alarm is enabled when two different analog signals rise and fall relative to respective thresholds according to a prescribed sequence. A ratio alarm is enabled when,



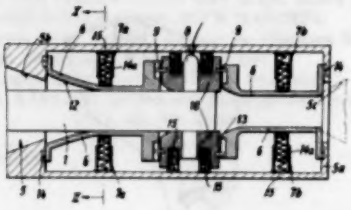
for example, the defect and rear surface analog signals are compared and they exceed a predetermined ratio thereof. A third alarm is enabled when defects occur that are not characterized by the transposition or ratio methods.

3,640,123

APPARATUS FOR NONDESTRUCTIVE MATERIALS TESTING OF CONTINUOUSLY ADVANCED WORKPIECES

Herbert Vogt, Dechant-Linden-Weg 31, 5042 Liblar, and Helmut Pause, Gotenring 59, 5 Cologne-Deutz, both of Germany

Filed Mar. 21, 1969, Ser. No. 809,240
Int. Cl. G01n *29/04*
U.S. Cl. 73—71.5 **12 Claims**



An apparatus for nondestructive materials testing of continuously advanced workpieces of preferably oblong shape. This apparatus has at least one holder, in order to support an ultrasonic transducer. The holder is mounted in the throughfeed section to transmit and receive, respectively, testing signals, to and from said workpiece. Further, pressure structure is provided for pressing the transducer against the workpiece, to provide a measurement coupling of the transducer with the workpiece, when latter is passing said transducer. The holder is provided with at least one funnel-type inlet throughfeed to adjust the direction of the workpiece with respect to the holder. There is at least one movably supported guide which is arranged ahead of the transducer holder. In order to guide the workpiece, when passing the transducer a spring structure is provided also for pushing the guide into the throughpassing space and against the throughpassing workpiece. The resilient structure is arranged around the perimeter of the guide in order to have an equal distribution of resilient forces on the guide.

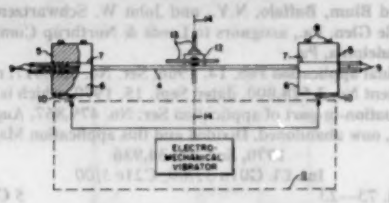
3,640,124

RESONANT FIXTURE VIBRATION AMPLIFIER

John Verga, Rockville Centre, N.Y., assignor to Hazeltine Research, Inc.

Filed June 18, 1969, Ser. No. 834,399
Int. Cl. G01n *29/00*
U.S. Cl. 73—71.6 **5 Claims**

Disclosed is a resonant fixture vibration amplifier capable of producing accelerations along a single axis without fatiguing. The amplifier utilizes a resonant member equally fixed at opposite ends, centrally loaded, and capable of resonating at



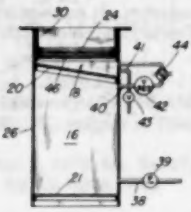
a selected frequency, thereby subjecting test specimens to accelerations along a single axis.

3,640,125

WATER ABSORPTION TEST METHOD

Christian F. Girard, Ottawa, Ontario, and Gerald J. Derouin, Hull, Quebec, both of Canada, assignors to Canadian International Paper Company, Montreal, Quebec, Canada

Filed Nov. 17, 1969, Ser. No. 877,201
Int. Cl. G01n *33/34*
U.S. Cl. 73—73 **3 Claims**



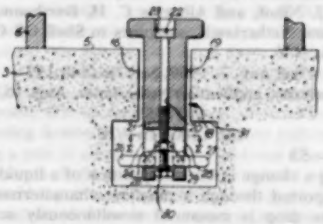
Method for testing the water absorption characteristics of building board materials, for example, Masonite, in which the rough side of the board is submerged in water and the smooth side subjected to a predetermined vacuum for a predetermined interval of time. The time and vacuum parameters of the method are calculated to achieve as closely as possible the same water absorption and thickness results as are obtained with the standard 24-hour test method.

3,640,126

TESTING OF CONCRETE

Moshe Te'eni, Southampton, England, assignor to National Research Development Corporation, London, England

Filed Aug. 4, 1969, Ser. No. 847,228
Claims priority, application Great Britain, Aug. 7, 1968, 37,732/68
Int. Cl. G01n *3/00*
U.S. Cl. 73—88 R **3 Claims**



The strength of a brittle material, such as concrete, is tested by applying opposing forces on a ring of predetermined dimensions on the surface of the material and an area

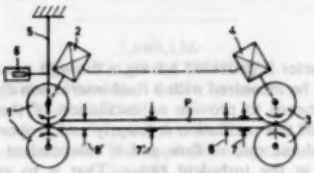
which is within the material and smaller than that of the ring, the forces being applied in the sense to pull out material against reaction on the ring. In practice the ring is defined by an annular member disposed on the material surface, and the small area by a boltlike insert which can be of simple unitary form embedded in cast material or expandible head form secured in a suitable bore and cavity in solid material, while the force is applied by a hydraulic ram coupling the insert and annular member. An important feature of the test is the predetermined containment of prospective material rupture by the ring, thus affording a controlled test which correlates well with conventional test results.

3,640,127

PROCESS AND APPARATUS FOR THE DETERMINATION OF STRESS-STRAIN RELATIONSHIPS OF SOLIDS AND VISCOUS LIQUIDS, ESPECIALLY OF MATERIALS IN THE VISCOELASTIC STATE

Joachim Meissner, Fussgoenheim, Germany, assignor to Badische Anilin & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhineland Theinland-Pfalz, Germany

Filed Apr. 30, 1970, Ser. No. 33,305
Claims priority, application Germany, May 2, 1969, P 19 22 414.7
Int. Cl. G01n *3/08*
U.S. Cl. 73—95.5 **14 Claims**



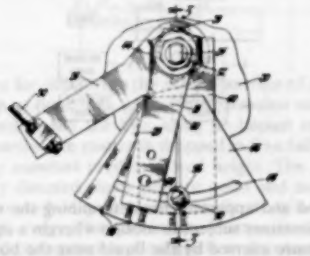
A process for determining the elastic and irreversible plastic parameters of materials of consistencies ranging from doughy to molten at a constant rate of extension, and an apparatus for carrying out said process in which two pairs of wheels separated by a predetermined distance act on a bar-shaped test specimen at a constant peripheral speed and in which molten specimens are supported by the surface of a liquid.

3,640,128

THROTTLE VALVE GAUGE

Alfred C. Cunning, Indianapolis, and Harry D. Wolverton, Brownsburg, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 10, 1969, Ser. No. 875,280
Int. Cl. G01m *13/02*
U.S. Cl. 73—118 **5 Claims**



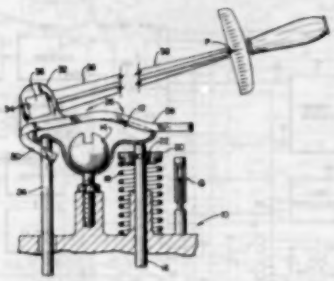
This gauge has a base member with a jaw which clamps to the selector lever nut of a transmission control to hold the gauge on the transmission housing. There is a gauging plate having spaced indicia thereon which indicates proper positions of the throttle valve lever from a fixed station when actuated by throttle pedal through the throttle valve linkage. The gauging plate is adjustably mounted on the base so that particular indicia on the plate can be aligned with the throttle valve lever when the lever is at a predetermined position to serve as a starting point in determining whether the linkage will accurately move the lever to other predetermined positions.

3,640,129

VALVE SPRING TESTER

John C. Bandimere, 3740 Fenton St., Wheatridge, Colo.

Filed Sept. 5, 1969, Ser. No. 855,653
Int. Cl. G01m *13/00*; G01l *1/04*
U.S. Cl. 73—119 R **9 Claims**



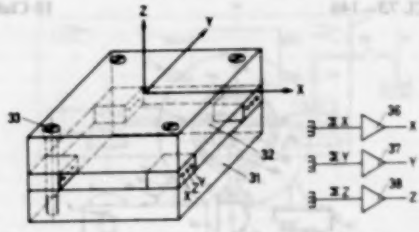
Valve spring tester and method for testing the strength of valve springs in situ on valve-in-head engines, the valves of which are operated by rocker arms, characterized by a lever tool affixed to a torque wrench. The tool may be readily secured directly to a rocker arm for rotating same and compressing its associated spring to desired length at which the torque wrench provides a reading which is a measure of the spring strength or force at the particular length to which it has been compressed.

3,640,130

FORCE AND MOMENT ARRANGEMENTS

Gelli Spescha; Karlheinz Martini, both of Winterthur, and Hans Conrad Sonderegger, Neftenbach, all of Switzerland, assignors to Kistler Instrumente AG, Winterthur, Switzerland

Filed Oct. 30, 1969, Ser. No. 872,557
Claims priority, application Switzerland, Nov. 4, 1968, 16433/68
Int. Cl. G01l *5/12*
U.S. Cl. 73—133 **7 Claims**



A force and moment measuring arrangement comprises a measuring unit embodying a plurality of force-measuring cells and amplifier arrangements operatively connected

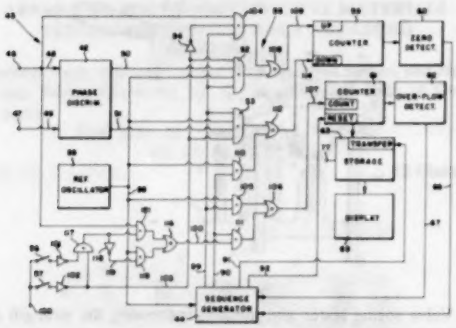
thereto, the force-measuring cells being disposed in the measuring units in relation to ordinate axes in such manner that output signals which are obtained from said cells in response to forces and moments acting on the unit and which are applied to the amplifier arrangements produce output quantities which are proportional to individual force components and force moments. The force-measuring cells of a measuring unit may each be responsive in one or more component directions. Means are provided for eliminating interfering signals.

3,640,131

HORSEPOWER METER

James R. Turk, Solon, Ohio, assignor to Marine Electro Mechanical, Inc., Wickliffe, Ohio

Filed May 18, 1970, Ser. No. 38,108
Int. Cl. G01l *3/10*
U.S. Cl. 73—136 A 13 Claims



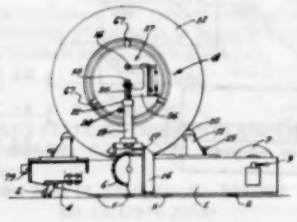
An instrument for providing a visual readout of horsepower, torque or r.p.m. consisting of a shaft interconnected between a load and a power source with a pair of tachometers coupled to the shaft at spaced locations to provide electrical indications of the speed of rotation and amount of twist of the shaft. A digital bidirectional counter and resettable binary coded decimal counter are gated for receipt of indications in two step sequences, to develop the desired signals in the latter counter. Cycling occurs continuously under direction of a sequence generator, and a storage register and display device retain the signals over a period of time to provide the visual readout.

3,640,132

TIRE UNIFORMITY TESTER

Edwin R. Miles, Huntsville, and Donald E. Dreier, Brownsville, both of Ala., assignors to Northrop Corporation, Beverly Hills, Calif.

Filed June 22, 1970, Ser. No. 48,299
Int. Cl. G01m *17/02*
U.S. Cl. 73—146 10 Claims



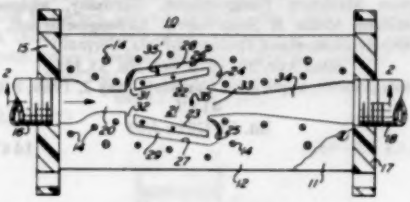
This machine tests the stiffness uniformity of a pneumatic tire body by rotating it while in place on a vehicle and resting on the tester, and recording vertical tire deflections (weak spots or hard spots) on a chart. The tester has a base frame with drive roller, an adapter carried by the tire wheel at its rim and holding a chart, a motion pickup linkage in touch with an axle of the adapter, and a scribe actuated by the linkage and bearing against the chart.

3,640,133

FLOWMETER

Robert B. Adams, Tredyffrin Township, Chester County, Pa., assignor to Moore Products Co., Spring House, Pa.

Continuation-in-part of application Ser. No. 618,472, Feb. 24, 1967. This application Jan. 10, 1969, Ser. No. 790,408
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 B 15 Claims



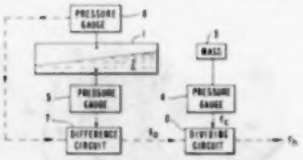
A flowmeter is provided having a through passageway for the flow to be measured with a fluid interaction chamber and feedback means to provide an oscillation of the flow. The frequency of this oscillation is linearly and proportionally related to volume rate of flow and is independent of all fluid properties in the turbulent range. That is to say that the frequency for a given volume flow rate will be the same for any liquid or gas as long as the flow is turbulent. Provisions are made for detecting this oscillation including means for reducing the turbulence at the detecting location and a sensor which is responsive to changes in the heat transfer rates to the surrounding fluid medium.

3,640,134

LIQUID LEVEL METER

Adrianus G. Hop, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed Dec. 8, 1969, Ser. No. 883,211
Int. Cl. G01f *23/14*
U.S. Cl. 73—299 5 Claims



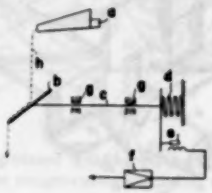
A method and apparatus for determining the mean liquid level in a container subject to motion wherein a signal related to the pressure exerted by the liquid near the bottom of the container is divided by a signal representing the acceleration forces on the container to provide a signal related to the mean liquid level in the container.

3,640,135

DEVICE FOR MEASURING FLOW RATES OF POWDERY AND GRANULAR MATERIALS

Hiroshi Tomiyasu; Tsuguya Inagaki, both of No. 162-2, Nagao, Kawasaki-shi, Kanagawa-ken; Hiroshi Kajiura, No. 22-7, 2-chome, Nishiazabu, Tokyo, and Kinnosuke Watanabe, No. 1948-11, Hosoyama, Kawasaki-shi, Kanagawa-ken, all of Japan

Filed Oct. 10, 1968, Ser. No. 766,515
Int. Cl. G01f 1/00
U.S. Cl. 73—228 7 Claims



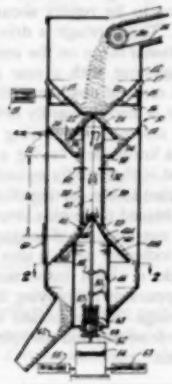
A method of measuring the flow rates of powdery and granular materials which comprises allowing a powdery or granular material to drop naturally by gravity from a certain height onto a detecting plate and then measuring the horizontal component of the force given to said plate as an impact load, and instruments for practicing the method.

3,640,136

MASS FLOW RATE METER

Claude B. Nolte, Placentia, Calif., assignor to Kingmann-White, Inc., Placentia, Calif.

Continuation-in-part of application Ser. No. 770,984, Oct. 28, 1968, now abandoned. This application Sept. 11, 1969, Ser. No. 857,174
Int. Cl. G01f 1/00
U.S. Cl. 73—228 27 Claims



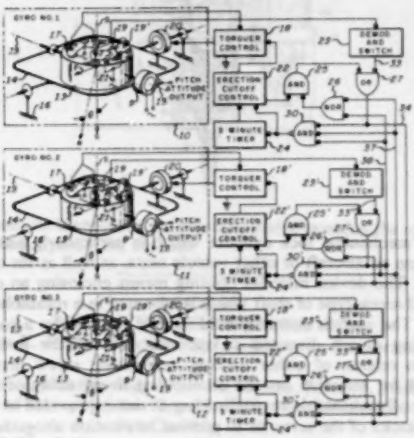
Apparatus for measuring the mass flow rate of particulate matter, such as flour, salt, grains, soap powder, sand, gravel, cement, sawdust and the like, using an impact sensor onto which the particulate matter is dropped in free fall through a substantially constant predetermined height. The sensor has an upwardly directed sharp edge or point and inclined surfaces and moves bodily in a substantially straight line, vertical direction only. The particulate matter is directed by inclined surfaces against vertical guide surfaces which direct the particulate matter to drop vertically onto the inclined sensor surfaces through a substantially constant, free fall distance. The average impulse of force applied to the sensor by the dropping particulate matter deflects it vertically to provide a measure of the rate of mass flow of the particulate matter through the apparatus. The displacement of the sensor is small with respect to the distance of particulate fall.

3,640,137

ERECTION CUTOFF SYSTEM FOR PLURAL GYROSCOPES

Terry S. Allen; Lynn R. Lane, both of Phoenix, and Harold Lee Swartz, Glendale, all of Ariz., assignors to Sperry Rand Corporation

Filed June 24, 1969, Ser. No. 836,027
Int. Cl. G01c 19/54
U.S. Cl. 74—5.34 6 Claims



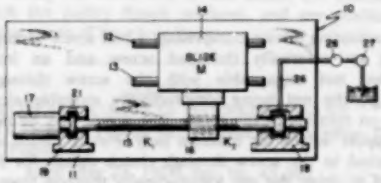
A system for ensuring that the long term erection sensors of a plurality of gyroscopes installed in the same aircraft and providing substantially identical attitude reference information are cut off simultaneously to thereby reduce discrepancies in the information supplied by each of the gyroscopes due to tolerances in the cutoff thresholds of the long term reference sensors of each gyroscope.

3,640,138

MACHINE TOOL

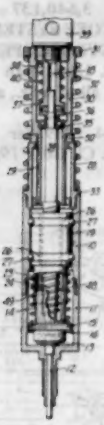
Robert S. Hahn, Northboro, and Thomas R. Keefe, Framingham, both of Mass., assignors to The Heald Machine Company, Worcester, Mass.

Filed Dec. 12, 1969, Ser. No. 884,450
Int. Cl. F16h 27/02
U.S. Cl. 74—89.15 5 Claims



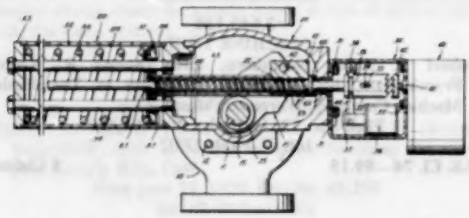
This invention relates to a machine tool and, more particularly, to machinery having a table which is slidable with substantially no friction, which is screw-driven, and which has means for restraining the screw to prevent erratic movement of the table.

3,640,139
MECHANICAL LOCK CYLINDER
Kamal Y. Aweimrine, 4209 West First St., Los Angeles, Calif.
Filed June 1, 1970, Ser. No. 42,330
Int. Cl. F16b 27/02
U.S. Cl. 74—89.15 7 Claims



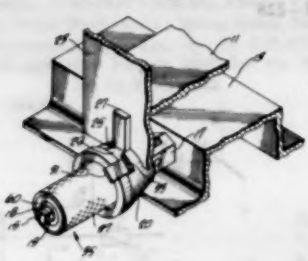
A mechanical lock cylinder which is particularly adapted for use on aircraft or other vehicle seats, as well as for other uses. The device includes housing means enclosing an elongated screw type of shaft which is mounted in a rotatable ball nut. The shaft is normally held against rotation by a pair of locking means disposed at opposite ends of the housing. Upon release of either locking means, the screw may be freed for selective inward or outward linear movement. A manually adjustable stroke limiting device is provided to limit the stroke of the screw or to prevent its rotation altogether.

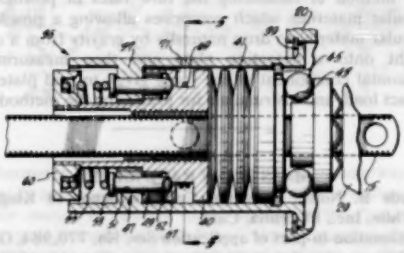
3,640,140
ACTUATOR
Ronald A. Gulick, Sugarland, and Charles H. Wicke, Richmond, both of Tex., assignors to Research Engineering Company, Houston, Tex.
Filed June 2, 1969, Ser. No. 829,523
Int. Cl. F16h 29/02
U.S. Cl. 74—89.15 17 Claims



An actuating device comprising: a ball screw arrangement having an externally threaded screw and an internally threaded nut engageable with the screw through ball bearings, the nut being longitudinally movable along the screw on rotation of the screw. The screw may be mounted on support means for rotation only. Power means may be connected to the screw through clutch means for rotation thereof to drive the nut longitudinally thereon from a first position to another. The nut is connected to a rotatable member by a mechanism adapted to convert longitudinal movement of the nut to rotational movement of a portion of a device connected to the rotatable member. A spring return unit may be attached so as to exert a force against the nut. The spring return unit may be adapted on disengagement of the clutch to drive the nut back to its first position.

3,640,141
EXTRACTOR HOLDDOWN APPARATUS
Robert A. Hollingsead, Yorba Linda; Abraham Kuchler, and Clyde Robert Pryor, both of Anaheim, all of Calif., assignors to Hollingsead-Pryor Enterprises, Inc., Santa Fe Springs, Calif.
Filed Dec. 19, 1969, Ser. No. 886,435
Int. Cl. F16h 27/02
U.S. Cl. 74—89.15 44 Claims



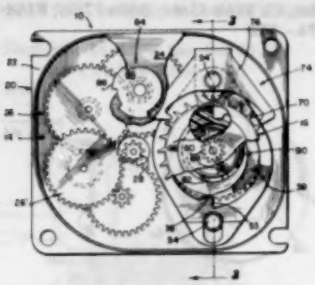


An extractor holddown apparatus is disclosed for displacing and securing a unit of electronic equipment onto a rack or shelf. The apparatus includes a spindle pivotally connected to the shelf. A carriage is threadedly mounted on the spindle and is adapted to be rigidly secured to the unit of electronic equipment. The carriage is driven along the spindle to apply a translational force on the unit to move the unit rearwardly into engagement with a rear connector, and to maintain the unit in a secured position with a desired amount of force. The carriage is also forwardly driven to function as an extractor. A drive assembly for driving the carriage along the spindle includes a knob shell having a drive nut located therein. The drive nut is threadedly mounted on the spindle and is resiliently coupled to the carriage for applying an axial force thereto. Spring biased drive pins interconnect the knob shell with the drive nut and are disengageable on a given amount of force. An indicator plate is also located within the knob shell to provide a visual inspection aid to indicate whether or not the apparatus is applying the desired amount of force on the carriage. Spring-biased self-locking means also interconnect the drive nut and the spindle to prevent antirotation therebetween.

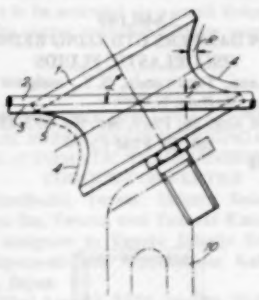
3,640,142
COMBINATION SPEED REDUCTION AND ESCAPEMENT MEANS
Richard W. Stafford, Clayton, Ind., and Milenko Cuckovic, Lund, Sweden, assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.
Filed June 17, 1970, Ser. No. 46,925
Int. Cl. F16h 27/04
U.S. Cl. 74—112 17 Claims

A gear reduction means and an escapement means are both disposed within a housing which carries a drive motor coupled to the reduction means. The escapement means includes a rotating positioning means coupled to the gear

reduction means, a reciprocating regulating means responsive to movement of the rotating positioning means and an intermittent spring-biased rotating output means responsive to movement of the reciprocating regulating means.



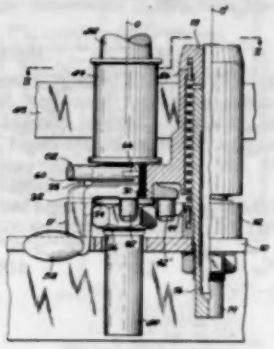
3,640,143
GUIDE PULLEY AND A METHOD FOR THE PRODUCTION THEREOF
Danckert Krohn-Holm, Oscarsgt. 13, Oslo 3, Norway
Filed Mar. 10, 1970, Ser. No. 18,233
Claims priority, application Norway, Mar. 11, 1969, 1006/69
Int. Cl. F16h *55/36*
U.S. Cl. 74—230.05 **2 Claims**



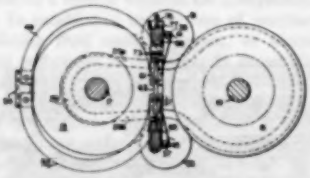
A guide pulley having a guiding groove shaped substantially as a hyperbolic body of rotation and the body guided thereby has at least a semicircular cross section rectilinearly moved at an acute angle to the pulley axis of rotation.

3,640,144
SPINDLE COUPLING
Heinrich Eckholt, Munster, Westphalia, Germany, assignor to Hamel G.m.b.H. Zwirnmaschinen, Munster, Westphalia, Germany
Filed Sept. 8, 1970, Ser. No. 70,122
Claims priority, application Germany, Sept. 11, 1969, G 69 35 778.4
Int. Cl. F16h *7/10;* **D01h** *13/14, 7/46*
U.S. Cl. 74—242.15 R **10 Claims**

A spindle to be intermittently driven by a continuously rotating belt is journaled on mounting arm which is swingable on a supporting rail about a pivotal axis parallel to the spindle axis. A lever fulcrumed on the spindle carries two rollers coacting with an encircling track fixed to the rail, the two rollers defining with respective recesses in the track a pair of stable positions in which the lever can be indexed by a toggle mechanism articulated to the mounting arm and the lever. A torsion spring anchored to the rail and to the mounting arm tends to swing the latter into the first stable position in which a whorl on the spindle engages the driving belt for frictional entrainment thereby; in the alternate stable position the spindle is decoupled from the belt.



3,640,145
MOTION TRANSMISSION DRIVE
Charles E. Kraus, Allendale, N.J., assignor to Excelermatic, Inc.
Original application Aug. 20, 1968, Ser. No. 753,941. Divided and this application May 21, 1970, Ser. No. 48,602
Int. Cl. F16g *13/02*
U.S. Cl. 74—248 **7 Claims**

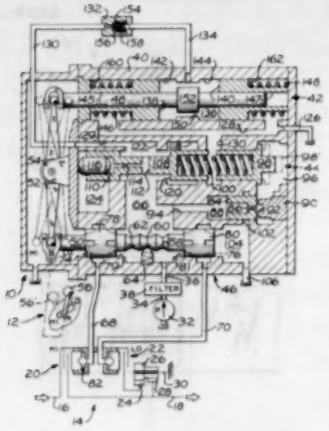


A chain for a power transmission device having longitudinally extending contact surfaces engaging the pulley flanges which lie along the centerline of the chain, are essentially flat, match the pulley flange surfaces, and are positioned between the joints of the chain links.

3,640,146
HYDRAULIC SAFETY OVERRIDE VALVE
Randolph C. Barnes, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed May 28, 1970, Ser. No. 41,202
Int. Cl. F16h *5/12;* **F15b** *20/00;* **F16d** *25/00*
U.S. Cl. 74—364 **9 Claims**

A hydraulic control valve for controlling a vehicle transmission comprising a manually actuable position selector valve for alternatively directing hydraulic fluid to first or second position clutches of the transmission from a neutral position, a pressure modulating relief valve for modulating the operation of the position selector valve, and a safety

override valve linked to the position selector valve for automatically returning the position selector valve to the neutral



position when hydraulic pressure is low thereby avoiding system damage.

3,640,147

TOOLHOLDER ASSEMBLY FOR MACHINE TOOL

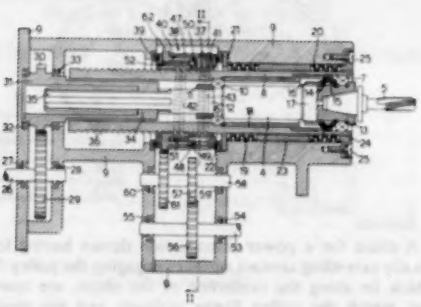
Giuseppe Fantoni, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Turin, Italy

Filed Mar. 2, 1970, Ser. No. 15,491

Claims priority, application Italy, Mar. 3, 1969, 50820 A/69

Int. Cl. F16h *1/18, 55/18*

U.S. Cl. 74—424.8 R **7 Claims**



In a device for feeding a quill of machine tool, which is slidable axially in a support, the quill is threaded externally and cooperates with a lead nut rotatable concentrically with respect to the quill and is integral with a gear rotatable to effect the advance of the quill. The lead nut comprises two parts which are spaced axially by a flexible annular plate formed between an internal groove and an adjacent external groove in the lead nut to permit axial adjustment of the two parts. The lead nut includes two independent ball circulation circuits one for each one of the two parts respectively. The quill is mounted in the support by means of two elastic bushes spaced from one another and adjustable axially by means of a pressure collar to eliminate axial play of the quill.

3,640,148

RETAINER CAP FOR A STARTER PINION

Ronald Fischbach, 2045 East 21st St., Brooklyn, N.Y.

Filed Oct. 12, 1970, Ser. No. 79,900

Int. Cl. F16h *55/04;* **B60b** *27/06;* **F16d** *1/06*

U.S. Cl. 74—434 **10 Claims**

A retainer cap for retaining a rotatable pinion, the lockable roller bearings and associated springs, of an automobile starter shaft and pinion mechanism, the top of the cap having centrally located therein an aperture defined by the cap's aperture inside perimeter in a shape corresponding to a transverse cross section across the automobile starter pinion such that the aperture inside perimeter includes between radially outwardly extending cutout spaces, radially inwardly directed projections corresponding to the shape of spaces between teeth of the starter pinion, whereby the retainer cap is placeable into a retaining position by snug insertion of the teeth through the scalloped spaces, thereby eliminating the need for the prior art retainer annular washer and two half moon retainer rings.

3,640,149

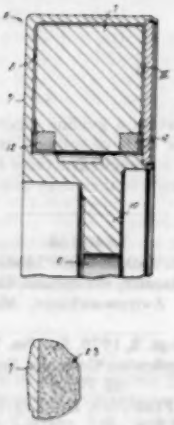
VIBRATION DAMPERS UTILIZING REINFORCED VISCOELASTIC FLUIDS

Ronald L. McLean, Tonawanda, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Aug. 26, 1969, Ser. No. 853,135

Int. Cl. F16f *15/10*

U.S. Cl. 74—574 **8 Claims**

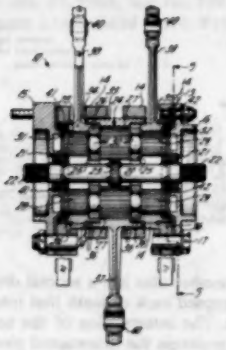


A vibration damper of the type having relatively movable parts with spaced confronting surfaces disposed to move in parallel relation during movement of the parts is provided with reinforced viscoelastic material in the space between the parts in engagement with the surfaces and shearingly resisting the relative movement.

3,640,150
POWER DRIVEN ACTUATOR OF THE COMPOUND PLANETARY GEAR TYPE

Robert L. Leiner, Pompton Lakes, and Salvatore Avena, Newark, both of N.J., assignors to Curtiss-Wright Corporation

Filed June 25, 1970, Ser. No. 49,657
Int. Cl. F16h *19/00, 1/32*
U.S. Cl. 74—674 5 Claims

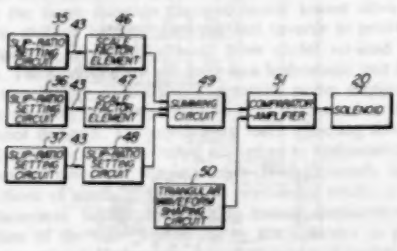


A power driven actuator of the compound planetary gear type which has two output members capable of movement relative to each other and to a fixed reference point through a combined arcuate distance of up to 360° for pivotally moving a member to be actuated via a crank linkage system interconnecting the output members and the member to be actuated.

3,640,151
DEVICE FOR CONTROLLING IN A STEPWISE MANNER HYDRAULIC PRESSURE OF WORKING OIL FOR USE WITH AN AUTOMATIC TRANSMISSION HAVING A TORQUE-CONVERTER

Masaharu Sumiyoshi, Toyota; Shigeru Sakakibara, Chita-gun; Osamu Ito, Toyota, and Takaaki Kato, Toyohashi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi and Nippondenso Kabushiki Kaisha, Kariya-shi, Japan

Filed Apr. 22, 1970, Ser. No. 30,871
Claims priority, application Japan, June 3, 1969, 44/43886; June 4, 1969, 44/43827
Int. Cl. F16h *27/00*
U.S. Cl. 74—731 4 Claims

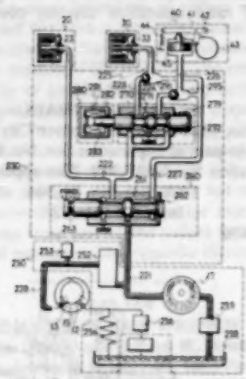


A device for step controlling the hydraulic pressure of working oil for an automatic transmission having a torque-converter comprising means for generating a signal representative of a slip ratio between speeds of a turbine and pump of the torque-converter, first valve means actuated by said signal so as to be opened or closed thereby varying the working oil pressure and second valve means actuated by the oil discharged from said first valve means for setting a predetermined pressure in response to said ratio depending upon whether it is higher or lower than at least two predetermined points, thereby reducing in a stepwise manner the pressure of working oil acting upon friction engaging means of the torque-converter when said ratio is increased whereby the working oil pressure can be suitably controlled in response to a desired torque transmission by the torque-converter.

3,640,152
CONTROL FOR AUTOMATIC TRANSMISSION

Takeaki Shirai, Nagoya-shi; Shigeru Sakakibara, Chita-gun, Aichi-ken; Masaaki Noguchi, Nagoya-shi, and Masaharu Sumiyoshi, Toyota-shi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Nippon Denso Kabushiki Kaisha

Filed Sept. 5, 1969, Ser. No. 855,510
Claims priority, application Japan, Oct. 18, 1968, 43/76293
Int. Cl. F16h *5/42*
U.S. Cl. 74—752 5 Claims



The present invention relates to a control for automatic transmission of a vehicle wherein the computation of the slip ratio may be established by any one of, mechanical means, means utilizing fluid under pressure, or electrical means; there being associated in combination therewith, a computing circuit which is applied for the determination of the number of revolutions of the engine of the vehicle, the number of revolutions of the output shaft of the torque converter or the power driven shaft of the drive unit of the vehicle, and there being additionally applied in connection therewith a logic product circuit, a logic sum circuit, a bistable memorial circuit and a synchronous time retaining circuit for effectuating the operation of electrically actuable distribution valve means to control the transition from high- to low-gear functions and vice versa for the vehicle.

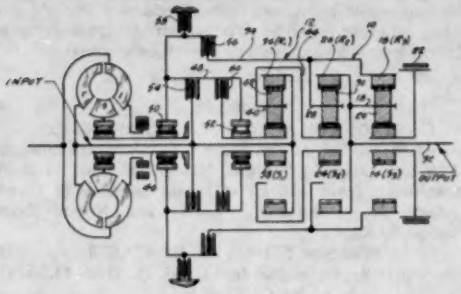
3,640,153
FOUR-SPEED RATIO POWER TRANSMISSION MECHANISM HAVING SIMPLE PLANETARY GEAR UNITS

Larry A. Kepner, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 18, 1970, Ser. No. 73,523
Int. Cl. F16h *3/44, 57/10*
U.S. Cl. 74—759 8 Claims

A power transmission mechanism for use in an automotive vehicle driveline comprising a three-speed ratio gear system having two torque input elements and a simple planetary ear unit situated between the torque input shaft and the two torque input elements of the three-speed ratio gear system, and clutches and brakes adapted to control the relative motion of the gear elements whereby the torque input shaft may be connected selectively to either of the torque input ele-

ments of the three-speed ratio gear system, the simple planetary unit being adapted to multiply the torque input to one of



the input elements of the three-speed ratio gear system during low-speed ratio operation thereby providing a fourth overall ratio.

3,640,154

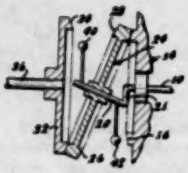
AXIAL GEAR TRAIN

Philip E. Massie, 4220 Irving Pl., Culver City, Calif.

Continuation-in-part of application Ser. No. 822,462, May 7, 1969, now Patent No. 3,587,349. This application Sept. 11, 1970, Ser. No. 71,306

Int. Cl. F16h *1/28*

U.S. Cl. 74—800 **12 Claims**



The device is an axial gear train or transmission for purposes of effecting a change of speed such as a substantial reduction in speed. A member having gear faces is mounted on a skew axle driven by a drive shaft; one gear face meshes with a nonrotating gear face. The other gear face meshes with a gear face on a driven shaft. The gear faces on the skew axle nutate or gyrate with the point of contact between meshing gear faces rotating. The skew axle is offset from the axis of the driving and driven shafts and the nutating gear faces are axially spaced from each other. The centers of the nutating gear faces are displaced radially from the axis of the driving and driven shafts. Gear trains for providing any desired speed ratios can be designed based on the parameters which are the number of teeth on respective gear faces; the axial spacing of the nutating gear faces; and the radial displacement of the centers of the nutating gears.

3,640,155

CONTROL SYSTEM FOR COORDINATED ACTUATION OF A TRANSMISSION AND THROTTLE

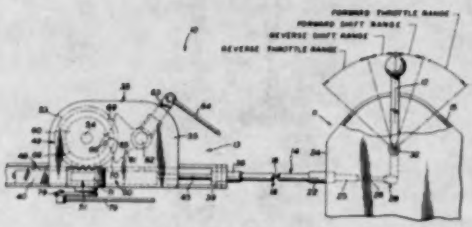
Donald W. Waner, Stow; John E. Litzell, Hudson, and Roger F. Olsen, Cuyahoga Falls, all of Ohio, assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Apr. 1, 1970, Ser. No. 24,566

Int. Cl. B60k *21/00*; **G05g** *9/08*

U.S. Cl. 74—875 **8 Claims**

A control system to provide shifting of a transmission in coordination with the opening and closing of a throttle, both located at a controlled station, by actuation of a single control lever at a control station remote with respect to the controlled station. Only a single push-pull cable is required to transmit motion from the control lever to a reciprocatingly slidable operating member at the controlled station. The operating member has a first drive means in the form of a full unbroken rack of teeth that meshingly engage a fully toothed pinion. Rotation of the fully toothed pinion in response to translation of the operating member effects a shifting of the transmission through a pair of cooperative, interrupted gears.



The operating member also has a second drive means in the form of an interrupted rack of teeth that interact with an interrupted pinion. The interruption of the teeth on both the rack and pinion maintain the interrupted pinion stationary in response to movements of the operating member during that portion of its translation by which the transmission is shifted. Thereafter, continued translation of the operating member brings the teeth on the second rack into meshing engagement with the teeth on the interrupted pinion to effect an opening or closing of the throttle.

3,640,156

CONTROL SYSTEM FOR AUTOMOTIVE AUTOMATIC TRANSMISSION

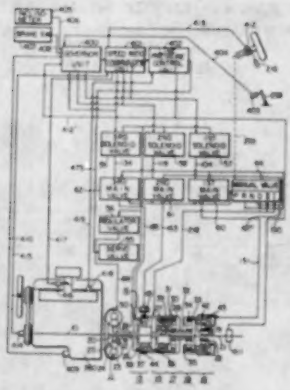
Yoichi Mori, and Hiroshisa Ichimura, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 29, 1969, Ser. No. 872,253

Claims priority, application Japan, Oct. 30, 1968, 43/78830

Int. Cl. B60k *21/08*; **F16h** *47/00*, *5/42*

U.S. Cl. 74—866 **11 Claims**



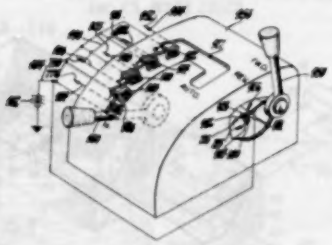
An automatic transmission mechanism for an automotive vehicle in which the transmission governing factors such as the position of the speed selecting lever, position of the accelerator pedal and the throttle valve, engine speed, vehicle speed and road grade are measured by electric means and the signals thus obtained are continuously fed into an elec-

tronic control system for evaluation of the requirements from the transmission. The electronic control system sends signals to elements converting them into hydraulic pressure which actuates friction elements to change gear ratios of the transmission.

3,640,157
POWER TRAIN CONTROL SYSTEM

Robert H. Schaefer, Westfield, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1968, Ser. No. 779,502
Int. Cl. B60k *21/06;* **B62d** *11/10;* **F16d** *67/00*
U.S. Cl. 74—869 **11 Claims**

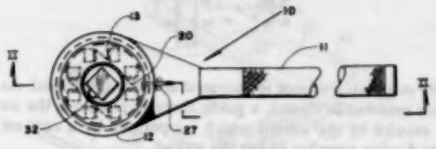


A control system is shown for a multispeed forward and reverse track-laying vehicle power train, the control system having a manual forward and reverse control for effecting manual shifts between forward and reverse, a manual drive range control and an automatic drive range control for effecting manual and automatic drive-range-shifting operation and a steering control for effecting steering operation. The manual forward and reverse control provides selection between forward and reverse drive in the lowest drive range and prevents such shifting by the operator in all of the higher drive ranges. The manual drive range control provides selection between the drive ranges with the selected drive range being established immediately on an upshift and by speed governed automatic shifting operation on a downshift. The automatic drive range control provides automatic shifting using separate speed-controlled upshift biases, an engine-torque-demand-controlled upshift-inhibiting bias and an engine-torque-demand-controlled downshift bias. Both the manual forward and reverse control and the manual drive range control are electrically activated and in the event there is an interruption in electrical power, the directional drive selected by the manual forward and reverse control is maintained while the range control, if under manual control, is automatically conditioned for automatic control to maintain power train control. A sequence control is effective to disengage the range drive to the load in the lowest drive range during shifting between forward and reverse to provide for engagement of the directional drive under no-load conditions. The steer control operates on a hydrostatic unit to control steering by controlling hydrostatic pump displacement while assuring straight vehicle no-drift motion when there is no steer demand. The controlling force effecting this pump displacement control is varied according to hydrostatic pump output to meet the varying steer load demands in both directions of steer. There is also provided a stroke or pump displacement limiter for limiting pump displacement regardless of the steer demanded by the operator to prevent pump overload. Hydrostatic system pressure is controlled by a pressure relief control in accordance with the engine torque demand and vehicle speed to both prevent overloading of the hydrostatic pump and limit the degree of steer bias. The steer control signals the range control to inhibit automatic range shifting during steering operation. The hydrodynamic torque converter in the power train has a lockup drive which is normally disengaged on range shifting and is held engaged during low speed operation in each range to provide for utilization of vehicle momentum to provide power for steering while preventing engine stall.

3,640,158
RATCHETLIKE WRENCH

Herman A. Myers, R.D. #1, Box 125, Lake Lynn, Pa.

Filed Dec. 4, 1970, Ser. No. 95,148
Int. Cl. B25b *13/00*
U.S. Cl. 81—5.83 **9 Claims**

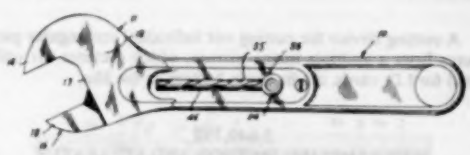


A ratchetlike tool in which there are three operable positions. The tool functions by means of rollers which become wedged or cammed between a retaining means and a hub to force a bearing surface of the hub into frictional engagement with a stationary portion of the wrench. The retaining means include a plurality of pairs of intersecting inclined surfaces upon which are positioned the rollers and a spring means to separate the rollers. A separator cooperating with the pairs of rollers is adaptable to move the rollers along the inclined planes to cause the camming relationship. When the separator is in its middle position, the hub does not move in either direction and movement of the separator into either of its other two positions frees one of the rollers from its cammed position to permit rotation in the opposite direction.

3,640,159
ADJUSTABLE JAW WRENCH

Kenneth F. Hails, Dallas, and Alfred H. Brickley, Garland, both of Tex., assignors to Space Tool, Inc., Pasadena, Tex.

Filed Aug. 26, 1970, Ser. No. 67,054
Int. Cl. B25b *13/16*
U.S. Cl. 81—165 **10 Claims**



A movable member carrying a movable jaw toward and away from a fixed jaw is reciprocated by means of a worm in the well-known manner. A drive mechanism for the worm includes a shaft with a helical groove rotatably mounted in the handle, and a thumb actuated button mounted for reciprocating movement and including a boss extending into the helical groove for rotating the shaft. The helical shaft drives the worm through mating gears.

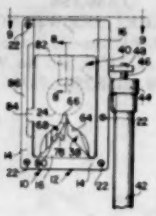
3,640,160
STRAND HANDLING

John Nelson, North Kingstown, and William E. Stoppard, Warwick, both of R.I., assignors to Leesona Corporation, Warwick, R.I.

Filed Dec. 24, 1969, Ser. No. 887,817
Int. Cl. B65h *29/24*
U.S. Cl. 83—24 **18 Claims**

A method and apparatus for severing a generally axially moving strand carried in an airstream. Closing of a slide valve member reduces the velocity of, and preferably sub-

stantially stops the stream, thereby reducing the velocity of and preferably stopping the strand. Substantially simultaneously therewith, and preferably after the strand is substantially stopped, a scissor is operated to sever the strand. As the valve member is closed, a guide thereon positions the strand for receipt by the scissor which is operated by a cam on the closed valve member to cut the strand.

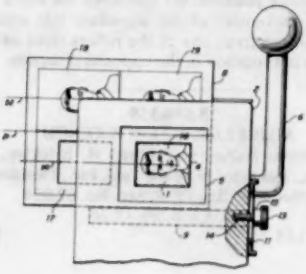


3,640,161

METHOD FOR CUTTING OUT INDIVIDUAL PICTURES FROM A MULTIPLE IMAGE PICTURE

Roger J. Kuhns, Lincoln, Mass., assignor to Avant Incorporated, Lincoln, Mass.

Filed Feb. 9, 1970, Ser. No. 9,647
Int. Cl. B26d 7/16
U.S. Cl. 83—36 **3 Claims**



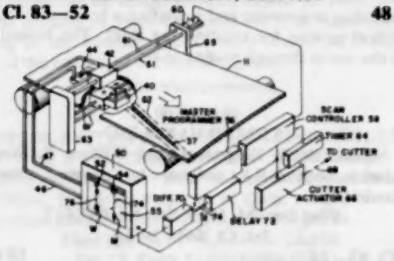
A cutting device for cutting out individual rectangular pictures from a multiple image picture, which pictures are utilized for I.D. cards, credit cards, badges or the like.

3,640,162

WEB-SAMPLING METHOD AND APPARATUS

John W. Fleming, Jr., and James Michael McMullen, both of Columbus, Ohio, assignors to Industrial Nucleonics Corporation

Original application Dec. 14, 1966, Ser. No. 601,750. Divided and this application July 24, 1969, Ser. No. 870,796
Int. Cl. B26d 7/26; B26f 1/38
U.S. Cl. 83—52 **48 Claims**



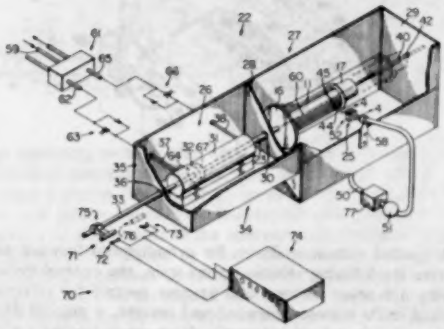
Method and apparatus for cutting samples from a longitudinally moving web in order to check calibration of online moisture gauge. The cutter and gauge are mounted on a carriage so that both may be moved transversely relative to the moving web in order that the cut sample has the same characteristics as the portion analyzed by the gauge. The cutter comprises a pair of blade edges tapering from a common point where the edges selectively intersect the web.

3,640,163

METHOD OF SEVERING FILAMENTARY MATERIAL

Dante S. Giardini, Dayton; George A. Preston, Xenia, and Richard N. Roney, Dayton, all of Ohio, assignors to The Bendix Corporation

Filed Oct. 15, 1969, Ser. No. 866,695
Int. Cl. B24c 1/00
U.S. Cl. 83—53 **5 Claims**



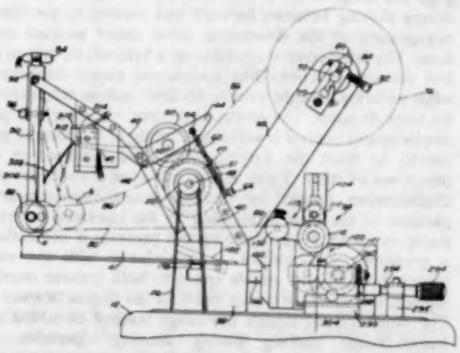
An apparatus for and method of severing a tangled sleevelike mass of a material, such as fiber glass yarn, from an associated spool using a high-velocity fluid jet defined either by a liquid or by a gas-containing abrasive particles wherein the high-velocity jet is impinged against the sleevelike mass while relatively moving the spool and high-velocity jet to provide efficient severing of the sleevelike mass along the full length of the spool.

3,640,164

AUTOMATIC CHAIN-CUTTING MACHINE

Thomas J. Crafford; Alexander I. Shilo, and Harry W. Cary, Jr., all of East Providence, R.I., assignors to Crafford Tool & Die Co., Riverside, R.I.

Filed May 7, 1969, Ser. No. 822,422
Int. Cl. B26d 5/24, 5/28
U.S. Cl. 83—67 **10 Claims**



A machine for automatically cutting chain in predetermined lengths and including means for feeding the chain to a

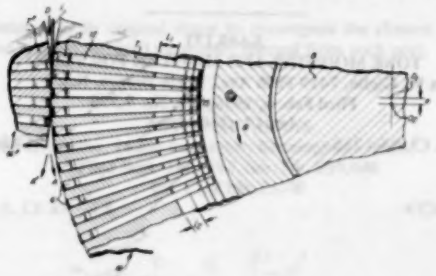
cutting station, means responsive to a drive for the feeding means for generating a series of electrical impulses, and a cutting assembly located at the cutting station and being operative in response to generation of a selected number of electrical impulses for periodically cutting the chain in the predetermined lengths.

3,640,165

DEVICE FOR FORMING THE STATOR CORES FOR DYNAMOELECTRIC MACHINES AND ALTERNATING CURRENT MACHINES

Terumoto Yamaguchi, Anjo-shi, Japan, assignor to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Dec. 8, 1969, Ser. No. 883,128
Claims priority, application Japan, Dec. 26, 1968, 43/96200
Int. Cl. B23d *25/12*
U.S. Cl. 83—116 **2 Claims**



A device for forming the stator cores for dynamoelectric machines and alternating machines, comprising a pair of rotary cutter assemblies disposed in axially parallel relation with each other, each of said rotary cutter assemblies comprising a rotary cutter having a plurality of cutter blades arranged around the outer periphery of said rotary cutter in equiangularly spaced relation from each other by an angle corresponding to the pitch of the poles of said core, each of said cutter blades having suitable dimensions, and a plurality of slots formed therein between the adjacent cutter blades, a plurality of plungers slidably fitted into said plurality of slots respectively, a supporting plate disposed within said rotary cutter for holding in position the end portions of said plurality of plungers, and a shaft rotatable about the center of rotation offcentered by a suitable distance from that of said rotary cutter and adapted to rotate said supporting plate in the same direction and at the same angular velocity as those of said rotary cutter, whereby a long continuous strip introduced or fed between said pair of rotary cutter assemblies is cut in the zigzag form in the longitudinal direction and the direction perpendicular relative thereto, thereby forming a plurality of cutting strip each having a series of tooth-shaped poles from a single strip without causing any waste and at a low cost.

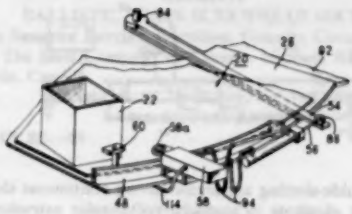
3,640,166

MACHINE FOR CUTTING SLABS FROM ICE BLOCKS

Chester S. Michals, North Hyde Park, N.Y., and Philip J. Motroni, Fox Lake, Ill., assignors to Air Reduction Company, Incorporated, New York, N.Y.

Filed Oct. 1, 1968, Ser. No. 764,134
Int. Cl. B26d *4/42*
U.S. Cl. 83—201 **5 Claims**

A rotatable table carries a plurality of open-bottomed holders for blocks of material to be cut, more specifically dry ice. Under the table is a sector plate of about 240° to 270° of arc and spaced from the bottom surface of the table by a vertical distance not greater than the smallest thickness of slab to be cut. Beyond one edge of the sector plate, is mounted an indexing platform the height of which can be adjusted according to the exact thickness of slab desired. Beyond the edge of the indexing plate and still within the open portion of the sector plate, is a horizontal bandsaw blade operable with a slight clearance space from the bottom of the table. The block to be cut slides upon the sector plate as the table rotates and drops onto the indexing platform. Means then are actuated to hold the block in suspension within the holder as



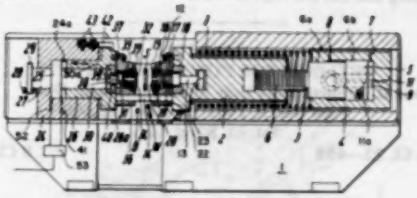
the block approaches the saw blade. An even cut is made parallel to the bottom face of the block without danger of jamming or breaking the block. When the clamped upper portion of the block is carried over the sector plate again, the clamping means is released and the block falls to the sector plate in preparation for another cut. A chute is provided below the saw blade and a sweeper arm is actuated after every cut to remove any debris from the indexing platform.

3,640,167

PUNCHING APPARATUS

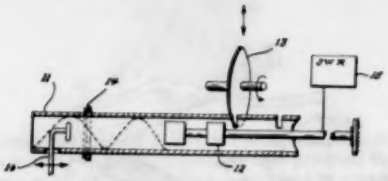
Adam Axtmann, Burbach, Germany, assignor to Maschinenfabrik Lorenz AG, Ettlingen (Baden), Germany

Filed June 15, 1970, Ser. No. 46,341
Claims priority, application Germany, June 14, 1969, P 19 30 398.1
Int. Cl. B26d *5/42*
U.S. Cl. 83—380 **11 Claims**



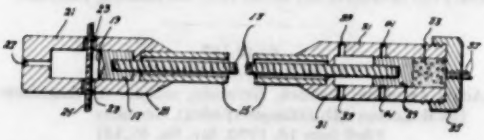
A punching apparatus in which two tool portions come together to punch out a workpiece. At least one tool portion is mounted on a cylinder housing with one part of that tool portion fixed relative to the cylinder housing and another part movable relative to the cylinder housing. Such movement of the tool parts is provided by inner and outer piston systems in the cylinder housing. Either piston system can be fixed to the cylinder housing while the other remains movable relative to the cylinder housing. The movable part of the tool portion can be connected to either piston system, depending on which is arranged to be movable relative to the cylinder housing.

3,640,168
ELECTRICALLY PRECISE SLOTTED WAVEGUIDE
John H. Staehlin, Baltimore, and Gilbert A. Peon, Greenbelt, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force
Filed Aug. 7, 1970, Ser. No. 61,887
Int. Cl. B26d 7/16
U.S. Cl. 83—444 **3 Claims**



A waveguide-slotting apparatus having continuous slotting of radiating elements in standard rectangular extrusions or drawn tubing which are precisely located electrically.

3,640,169
PYROTECHNIC REMOTE CUTTER
Sidney Rosenthal, West Newton, Mass., assignor to The United States of America as represented by the Secretary of the Air Force
Filed July 24, 1970, Ser. No. 57,917
Int. Cl. B26d 5/04
U.S. Cl. 83—639 **2 Claims**

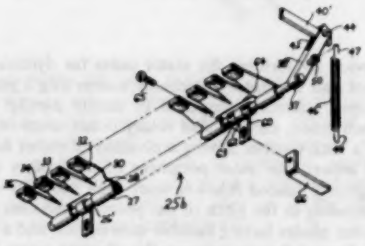


A flexible cable is interposed between a cutting element and an electrically ignitable pyrotechnic device. The cutting element is attached to one end of the cable and rests in a cylinder having an opening through which the rope or wire to be cut is passed. Energization of the pyrotechnic device at the other end of the cable produces forward movement of the cable causing the cutting element to move across the opening and cut the rope or wire.

3,640,170
RETAINER FOR PUNCH AND DIE SETS
Arthur D. Bennett, 8484 Daly Road, Cincinnati, Ohio
Filed Dec. 5, 1969, Ser. No. 882,608
Int. Cl. B26d 7/26
U.S. Cl. 83—698 **9 Claims**

A retainer mechanism for a headless piercing punch (or the die button) comprising a cylindrical roll pin rotatably journaled in the punch-retainer block and extending at right angles to the longitudinal axis of the punch. The roll pin includes a locking portion intermediate its length which establishes a wedging engagement with an angular cross recess machined in the cylindrical shank of the punch to prevent displacement as the punch is stripped or withdrawn from the workpiece. An actuating screw is threaded into the retainer block parallel to the axis of the punch and has a necked portion in driving engagement with the locking portion of the roll pin so as to impart rotary motion to the roll pin in locking and unlocking directions upon rotation of the actuating screw with a suitable tool. When in the unlocked position the headless shank of the punch is free to be withdrawn outwardly from its bore in the retainer block. As applied to a coacting punch and die set, the angulation of the cross recess of the punch and die button is reversed so that both elements are capable of resisting the withdrawal forces as the piercing end of the punch is withdrawn from the aperture of the die button and workpiece.

3,640,171
TONE MODIFIER AND MUFFLER FOR PIANO
John W. Giglio, 7419 Fifth Ave., North Bergen, N.J.
Filed Feb. 6, 1970, Ser. No. 9,350
Int. Cl. G10c 3/00
U.S. Cl. 84—216 **3 Claims**

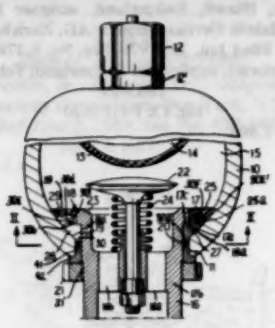


An attachment for a grand piano has a flexible strip secured on a shaft which is mountable rotatably underneath the strings of the piano. The strip and shaft can be turned by a linkage means terminating in a control knob at the front of the piano. In one position of the strip it is interposed between the hammers and strings to modify the tone of the piano and in a second position it is out of the way of the hammers. The tone can be modified to sound like a harpsichord or it can be muffled completely depending on the material of the strip.

3,640,172
LOCKING RING FOR PRESSURE VESSEL
Jacques H. Mercier, 49 Rue de Naples, Paris, France
Original application Feb. 2, 1967, Ser. No. 613,660, now Patent No. 3,537,481, dated Nov. 3, 1970. Divided and this application May 7, 1969, Ser. No. 822,445
Int. Cl. F16b 21/00
U.S. Cl. 85—8.8 **3 Claims**

This invention relates to a locking ring for the closure plug of a pressure vessel for storing fluid under pressure and particularly of the type having a deformable partition such as a bladder therein. The closure plug has a flanged inner end of diameter slightly less than the diameter of the port of the pressure vessel into which it is to be inserted and the locking

ring normally is of greater diameter than said port and is foldable for insertion through said port so that it may then be



restored to its original shape to encompass the closure plug and restrain outward movement thereof from such port.

3,640,173

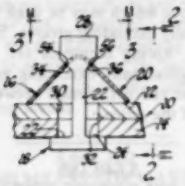
FASTENER MEANS

Curt G. Muller, 16265 Lockerbie, Birmingham, Mich.

Filed Sept. 18, 1969, Ser. No. 859,046

Int. Cl. F16b *21/06*

U.S. Cl. 85—8.8 **4 Claims**



A generally flat bolt member, having an abutment end effective for engaging one of at least two structural members to be assembled, has a head end provided for engaging a compressible retainer member situated against the opposite surface of another of the structural members; the retainer and head portion are provided with recess means and abutment means cooperatively engageable so as to collectively define disengageable detent means effective for locking the bolt and retainer in assembled relationship.

3,640,174

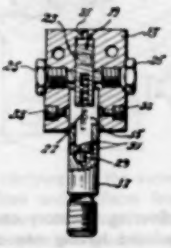
PYROMECHANICAL RELEASE DEVICE

Bruce Eaton, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Jan. 13, 1971, Ser. No. 106,066

Int. Cl. F16b *21/10*

U.S. Cl. 85—9 **2 Claims**



A quick-release disconnect device having a load bearing bolt positioned vertically in a central opening in a main body. A frangible shear pin positioned across the upper part of the central opening prevents vertical movement of an upwardly biased retainer member which retains the load bearing bolt in position by preventing inward movement of a plurality of balls positioned through the wall of the load bearing bolt and in the main body and held against the sidewall of the retainer member. Destruction of the shear pin permits upwardly biased movement of the retainer member allowing the balls to drop inward and release the bolt from the main body.

3,640,175

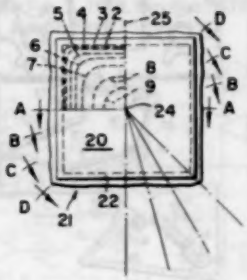
BALLISTIC SHAPE SCREWHEAD SOCKET

Allan Sangster Barclay, Hamilton, Ontario, Canada, assignor to The Steel Company of Canada, Limited, Hamilton, Ontario, Canada

Filed Oct. 18, 1968, Ser. No. 768,863

Int. Cl. F16b *23/00*

U.S. Cl. 85—45 **6 Claims**



Square socket-type head for screw fasteners, and punch for forming same, in which the socket has four equal sides each of which has an upper slightly inwardly inclined flat portion which merges without discontinuity at its lower end with a lower concave bottom portion.

3,640,176

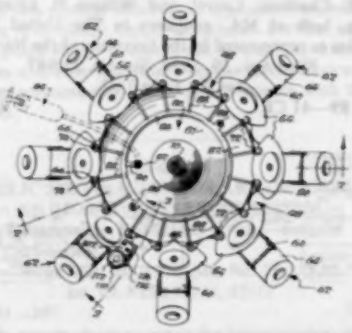
LUBRICATING SYSTEM FOR BRAIDING MACHINES

Robert G. Gaul, N. Tonawanda, N.Y., assignor to Paragon Wire & Cable Corporation, Buffalo, N.Y.

Filed Feb. 12, 1970, Ser. No. 10,889

Int. Cl. D04c *3/00*

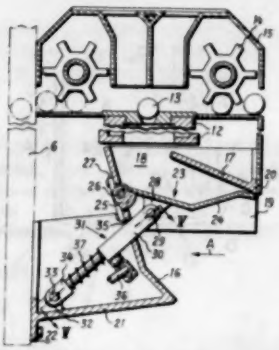
U.S. Cl. 87—33 **2 Claims**



This system is applied to braiding machines of the type which wind a plurality of threads or ribbons about a wire for insulating or protective purposes and these machines have a large number of moving parts which have heretofore required each of these parts to be lubricated by hand while

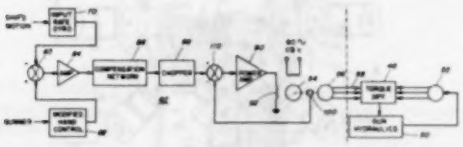
the machine was standing idle. This disclosure is for a system by means of which the moving parts can be lubricated at one time and thereby reduce the time during which the machine is standing idle.

3,640,177
FIRING BUTTON FOR RELEASING A TRIGGER AND OPENING A CARTRIDGE EJECTION GATE
Conrad C. Hottinger, Zurich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland
Filed June 4, 1970, Ser. No. 43,418
Claims priority, application Switzerland, June 18, 1969, 9276/69
Int. Cl. F41h 7/06
U.S. Cl. 89—33 F 6 Claims



An automatic firearm having a breech casing with means for feeding cartridges thereto. A channel is associated with the casing for the ejection of empty cartridge cases and a trigger release for firing is provided. A gate for the channel has means for operating the gate to open and close the channel. A common control means is provided for operating the trigger release and the means for operating the gate so that the gate is opened before the first round is fired and shut after the last round has been fired.

3,640,178
RATE STABILIZATION SYSTEM FOR A VEHICLE MOUNTED DEVICE
James R. Chatham, Laurel, and William H. Licata, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy
Filed Apr. 29, 1970, Ser. No. 32,947
Int. Cl. F41g 5/22
U.S. Cl. 89—41 CE 11 Claims

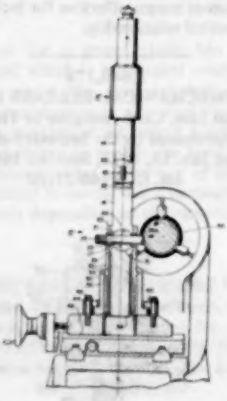


A rate stabilization system for a vehicle mounted tracking device employing an open loop control system that is interfaced with the existing control system of the device. Rate gyros detect movement of the vehicle and produce an error signal corresponding to this movement that is electronically processed to produce movement of the device in a direction that nulls out vehicle movement.

3,640,179
LOADING TRAY FOR A ROCKET
Hugo Sigrist, Hinwil, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland
Filed Jan. 28, 1970, Ser. No. 6,476
Claims priority, application Switzerland, Feb. 7, 1969, 1883/69
Int. Cl. F41f 9/00
U.S. Cl. 89—1.801 3 Claims

A loading tray for a rocket launcher having a longitudinally extending groove on the inside of the tray. A rail is mounted in the groove which may be sunk radially to the tray into said longitudinally extending groove. The rail has a guide groove for rockets. Spring elements are arranged between the base of the longitudinally extending groove and the two ends of the rail. The rail is fastened between the spring elements to the base of the groove.

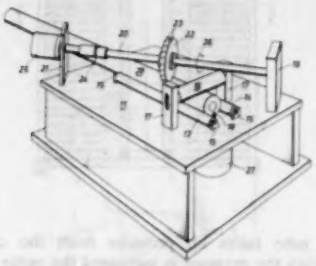
3,640,180
APPARATUS FOR DELIVERING VIBRATORY ENERGY
Nicholas Maropis, West Chester, Pa., assignor to Aeroprojects Incorporated, West Chester, Pa.
Filed Apr. 17, 1970, Ser. No. 29,588
Int. Cl. B23b 3/00
U.S. Cl. 90—11 R 12 Claims



A device for delivering vibratory energy to a work-performing tool is disclosed having one end connected to a vibration generating means and providing for mechanical attachment and alignment of the tool at the work-performing locale which is located at a vibrational antinode in the vibra-

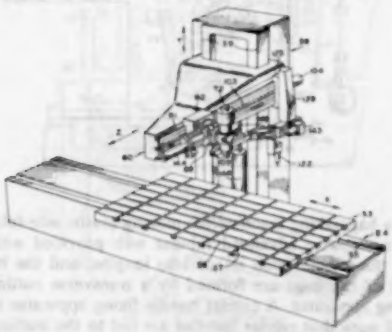
tory system. The vibratory device, or toolholder, may be conveniently mounted on a lathe crossfeed table.

3,640,181
SPIRAL TUBING CUTTER
William A. Whitfill, Jr., Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed June 2, 1969, Ser. No. 829,598
Int. Cl. B23c *3/32*
U.S. Cl. 90—11.4 **5 Claims**



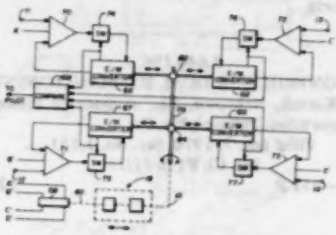
Apparatus for producing lengths of helical- or spiral-shaped filler material for use in the manufacture of marine seismic streamers. The cutting apparatus includes means for applying a simultaneous longitudinal and rotational motion to a length of tubular filler material, together with cutting means to smoothly cut through the tubing wall and means for holding the tubing in place against the cutting means while it is being moved both longitudinally and rotationally with respect to the cutting means.

3,640,182
METHOD AND MEANS FOR MAKING MASTER MODELS
Thomas D. Vertin, 37540 Lake Shore Road, Mount Clemens, Mich.
Original application Feb. 8, 1967, Ser. No. 614,752, Pat. No. 3,472,122. Divided and this application Oct. 8, 1969, Ser. No. 864,650
Int. Cl. B23c *1/16*
U.S. Cl. 90—13.8 **8 Claims**



An apparatus for carrying out the automatic machining of three-dimensional lines and surfaces for making a master model comprising three components which are controlled to move in a straight line, including an X-component which has a horizontal longitudinal X-movement, a Y-component which has a vertical Y-movement, and a Z-component which has a horizontal Z-movement at 90° o the X-movement, a tool operatively mounted on one of said components, power means operatively connected to each of said three components for moving the components in said controlled straight line movements, a signaling device for each of two of said components for controlling the power means therefor, a first source of two-dimensional data mounted on one plane, and a second source of two-dimensional data mounted on another plane perpendicular to said one plane, and a sensing element for each of said signaling devices which engages and is responsive to one of said two-dimensional data sources, whereby the power means controlled by the signaling devices cause their respective connected components to move precisely in accordance with the two-dimensional data, thereby producing a three-dimensional relative movement between the tool and the workpiece.

3,640,183
FORCE SUMMING MULTIPLEX ACTUATOR
Werner G. Koch, Arlington, and Jack McCurley, Dallas, both of Tex., assignors to LTV Electrosystems, Inc., Dallas, Tex.
Filed Feb. 2, 1970, Ser. No. 7,673
Int. Cl. F01b *25/26, 31/12*
U.S. Cl. 91—1 **15 Claims**

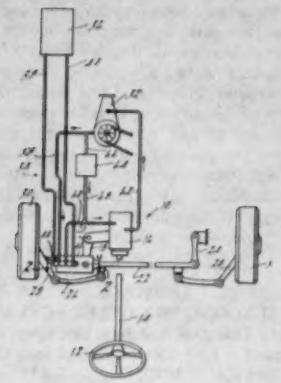


Four rotary-to-linear motion transducers each responsive to a separate but equal control signal are coupled together in a force summing arrangement to produce a linear motion output. Each of the rotary-to-linear motion transducers is part of a control channel that includes an asymmetrical breakaway force coupler for transmitting the linear motion output of the transducer to an attachment point on a torque tube. The breakaway coupler has a force responsive disconnect that is actuated when the force developed between the attachment point and the rotary-to-linear motion transducer exceeds a preset level. When the force between the attachment point and the transducer output exceeds the preset level, the disconnect actuates a switch to isolate the transducer for that channel from the control signal. Also included in each of the control channels is a position transducer for generating a feedback signal to balance out the generated control signals. At the output of the torque tube a linkage arrangement converts the rotary torque tube motion into a linear displacement that varies in accordance with the control signals.

3,640,184
HYDRAULIC SERVO ACTUATOR ARRANGEMENT FOR AN ADAPTIVE STEERING SYSTEM
John T. Kasselmann, Southfield, Mich., assignor to The Bendix Corporation
Filed Mar. 20, 1970, Ser. No. 21,323
Int. Cl. F15b *13/16, 15/17*
U.S. Cl. 91—387 **3 Claims**

A servo actuator arrangement for incorporating an adaptive steering system into a conventional power steering mechanism, utilizing a fluidic signal controlled three-way open-center servo valve and a pressure relief bypass in parallel with each other, both in series with the power steering hydraulic supply circuit in order to eliminate the need for a separate actuator fluid pressure source. The servo actuator

features a resilient, through-the-port mechanical feedback, and also features a connecting arrangement providing support for the rest of the steering linkage so as to be capable of being inserted into the existing steering gear without additional supports.

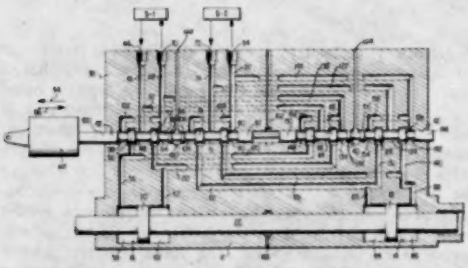


3,640,185

SERVOCONTROL FOR DUAL HYDRAULIC SYSTEMS

Kazimierz Korsak, Newtown, Pa., assignor to Piasecki Aircraft Corporation, Philadelphia, Pa.

Filed Jan. 7, 1970, Ser. No. 1,151
Int. Cl. F15b *11/16*
U.S. Cl. 91—411 R **12 Claims**



An improved servocontrol for redundant hydraulic fluid systems employing dual pressure sources each operating a separate actuator simultaneously to perform a common function. Two servo valve devices are employed, with each including valve elements connected in both hydraulic systems, thereby providing parallel control circuits from each pressure source to its associated actuator. The two servo valve devices are operated in synchronism by an input assembly permitting independent operation of one servo valve device in the event of jamming of the other. The parallel circuits, controlled through separate, independently operably valves, eliminate the possibility of a hydraulic lock in one actuator preventing operation of the other.

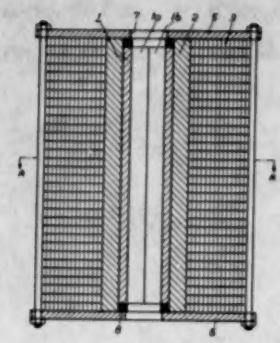
3,640,186

CYLINDER FOR ULTRAHIGH PRESSURE

Hans Lundstrom, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Jan. 12, 1970, Ser. No. 2,322
Claims priority, application Sweden, Jan. 29, 1969, 1148/69
Int. Cl. F16l *9/22, 9/16*; F02f *1/00*
U.S. Cl. 92—169 **6 Claims**

A high-pressure cylinder for hydrostatic extrusion is formed of an inner tube, a prestressed outer tube around the inner tube and a prestressed sheath surrounding the outer tube. The inner tube is of such a structure that pressure medium introduced into the cylinder can reach the outer side of the inner tube. When the pressure in the cylinder is low, the inner tube takes up pressure from the outer tube, whereas when the pressure is increased the outer tube is expanded out of contact with the inner tube. The inner tube may be formed of three tube sectors with longitudinal radial partition surfaces.

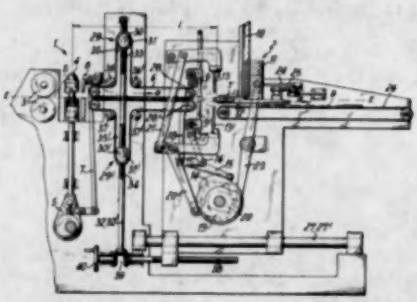


3,640,187

BAGMAKING MACHINES FOR MAKING PLASTICS SIDE-FOLD BAGS WITH CARRIER HANDLES

Friedhelm Mundus, Lengerich of Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed July 2, 1970, Ser. No. 51,915
Claims priority, application Germany, July 23, 1969, P 19 37 480.2
Int. Cl. B31b *1/00*
U.S. Cl. 93—8 R **5 Claims**



In a bagmaking machine for making plastic side-fold bags from a stepwise advanced tubular web provided with side folds, the tubular web is cut into lengths, and the bottom seams of the bags are formed by a transverse cutting and welding apparatus. A carrier handle fixing apparatus is controlled such that carrier handles are fed to the leading ends of the cut lengths of tubular web in the opposite direction to the direction of movement thereof and in the plane of movement thereof. The carrier handles are fixed while the cut lengths of tubular web are at a standstill. The finished bags are conveyed by a conveyor. The plane of the conveyor is displaced relative to the plane of conveyance of the cut lengths of tubular web such that discharge of the finished bags is not hindered by the carrier handle-fixing apparatus.

3,640,188

METHOD OF MAKING A PACKAGE, COMPRISING AN OUTER CARTON BLANK WITH ALINING AND PROVIDED WITH MEANS PREVENTING WEDGING

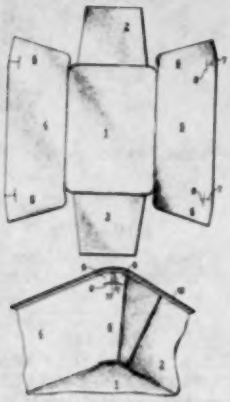
Rolf Magnus Dilot, Lund, Sweden, assignor to AB Akerlund & Rausing, Lund, Sweden

Original application Sept. 2, 1969, Ser. No. 854,575, now Patent No. 3,575,338, dated Apr. 20, 1971. Divided and this application Nov. 5, 1970, Ser. No. 87,114

Claims priority, application Sweden, Oct. 3, 1968, 13337/68

Int. Cl. B31b *49/02, 5/14, 1/62*

U.S. Cl. 93—36.01 **2 Claims**



A method for providing projections at the edge of traylike packages to prevent wedging when nesting or stacking a plurality of packages. The projections are made by flaps formed by slots at the upper edge of the carton, which flaps are depressed outwardly when a plastic foil is deep-drawn into the package.

3,640,189

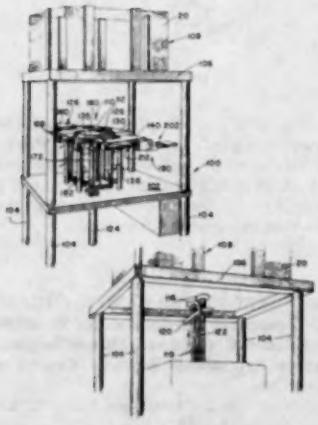
BOX MACHINE

Paul F. Bowman, Ridgewood, N.J., assignor to Broach Systems, Inc., Little Ferry, N.J.

Filed July 16, 1969, Ser. No. 842,117

Int. Cl. B31b *1/06, 1/54, 1/80*

U.S. Cl. 93—49 R **3 Claims**



A machine for automatically setting up boxes, having a frame which supports a bed and a magazine above the bed for holding box blanks. A pneumatic system draws the blanks one at a time down to the bed, and a plurality of plates sequentially fold the various blank walls and flaps into position.

3,640,190

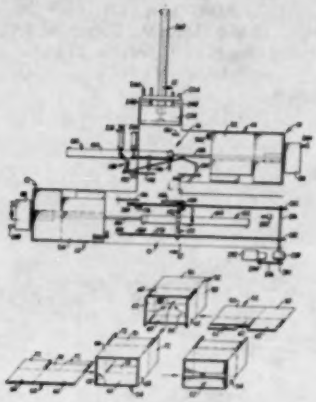
CARTON-HANDLING METHOD

Ralph A. Fuller, Exeter, and Earl D. Snodgrass, Lindsay, both of Calif., assignors to Herrick Waterman; Ralph A. Fuller and Earl D. Snodgrass, Exeter, Calif.

Original application Oct. 24, 1968, Ser. No. 764,049, now Patent No. 3,467,023, which is a continuation of application Ser. No. 558,731, June 20, 1966, now abandoned. Divided and this application Sept. 15, 1969, Ser. No. 871,149

Int. Cl. B31b *49/02, 1/78, 7/74*

U.S. Cl. 93—94 PS **2 Claims**



A machine for automatically unfolding pairs of carton blanks and telescoping them together to form a single composite carton. The machine comprises a pair of magazines adapted, respectively, to contain stacks of unfolded inner and outer carton blanks, a transfer and unfolder mechanism associated with each of the magazines to effect the one-at-a-time removal of carton blanks therefrom and the erection of the blanks upon removal, a plungerlike assembly mechanism to telescope the carton blanks together after their erection, and an extraction and delivery mechanism adapted to remove the erected and telescoped blanks from the area of the assembly mechanism.

3,640,191

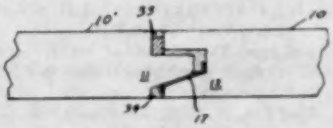
DECKING SYSTEM

John H. Hendrich, 542 West 6th St., Erie, Pa.

Filed July 25, 1969, Ser. No. 844,948

Int. Cl. E01c *5/00*

U.S. Cl. 94—13 **2 Claims**



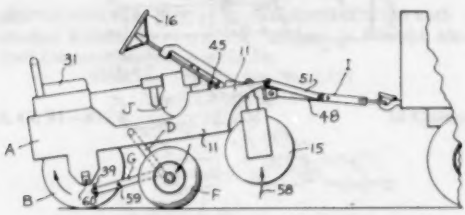
The slab module disclosed herein consists of a precast prestressed slab section which may have solid or a hollow core. The slab module has a longitudinal male inserting edge which when installed mates with a complimentary-shaped female receiving edge on a similar slab module. However, the dimensions of the female edge are slightly greater than the

corresponding male edges. The bottom surface of both male and female members are inclined at an angle to the plane of a side of the slab module so that the inserted module will move upward in translation as well as move toward the module into which its edge is being inserted. When the top or bottom surface (as desired) of the inserting module is at the same plane as the corresponding surface of the inserted module, a positioning spacer may be inserted to limit further movement and to maintain the relative position of the modules. The spacers may be in the form of plates which will vary in thickness. The joints between slab modules will be grouted after the slab modules are assembled. The modules will be drawn together by tendons. After assembly and adjustment of the slab modules, the tendons are post-tensioned and permanently anchored. The finished deck will appear and function as a smooth, continuous slab.

3,640,192
ROAD ROLLER

John H. Mauldin, 1606 N. Main St., Greenville, S.C.

Filed Oct. 1, 1970, Ser. No. 77,069
Int. Cl. E01c *19/26*
U.S. Cl. 94—50 R **5 Claims**



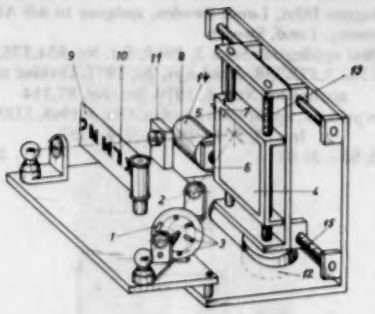
A road roller having an apparatus mounted on the frame thereof for transporting the roller behind a towing vehicle. The apparatus includes a pair of opposed supporting arms with wheels attached to the lower end thereof. A linkage arm connects a driven roller with the supporting arms so that by rotating the driven roller the wheels are brought in contact with the pavement to raise the front end of the road roller. By rotating the driven roller further the rear end of the road roller is raised off the ground. The road roller is provided with a vibrating apparatus which includes a pair of weights which are eccentrically carried on a shaft. The position of the weights can be adjusted relative to each other to vary the vibration imparted to the frame of a road roller.

3,640,193
LINE-DRAWING APPARATUS IN PHOTOGRAPHIC COMPOSING MACHINES

Hans Linde, and Peter Thienel, both of Berlin, Germany, assignors to H. Berthold Messinglinienfabrik und Schriftgieserei AG, Berlin, Germany

Filed Feb. 10, 1970, Ser. No. 10,265
Int. Cl. G03b *27/32*
U.S. Cl. 95—4.5 R **2 Claims**

Photographic composing machine for producing text layouts comprising a picture carrier having line elements, a sensitized photographic carrier having a light-sensitive coating interposed between the picture carrier and the photographic carrier which depicts a preselected line element in the plane of the light-sensitive coating whereby continuous relative motion of the depicted line element in relation to the sensitized photographic carrier draws lines in horizontal or



perpendicular directions in one process with composing of the text.

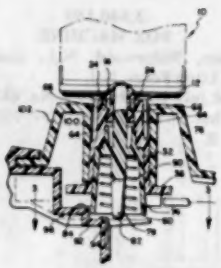
ERRATUM

For Class 95—11 see:
Patent No. 3,640,724

3,640,194
PHOTOGRAPHIC APPARATUS FOR MOUNTING A MULTILAMP FLASH UNIT

Bruce K. Johnson, Andover, and Donald H. Hendry, Quincy, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed June 29, 1970, Ser. No. 50,379
Int. Cl. G03b *17/48*
U.S. Cl. 95—11 L **13 Claims**



A mounting for a photographic flashcube. The mounting features two independently rotatable carriage members which are mechanically united upon engagement with the stem of a flashcube. A light spring within one of the carriage members provides for resetting the mounting upon removing a flashcube from engagement therewith.

3,640,195
CARDBOARD CAMERA AND KIT THEREFOR

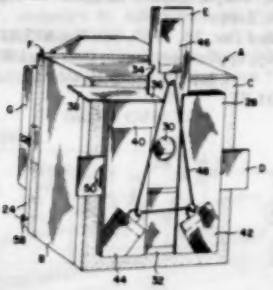
Burton R. Zimmerman, Medina; Roger W. Bodley, Chesterland, and Robert C. Goodman, Shaker Heights, all of Ohio, assignors to Educational Research Council of America, Cleveland, Ohio

Filed Apr. 23, 1969, Ser. No. 818,748
Int. Cl. G03b *19/02*
U.S. Cl. 95—11 R **7 Claims**

A camera which is suitable for student scientific work wherein the camera is constructed from a kit made up

primarily of a plurality of cardboard pieces obtained from a die-cut sheet of cardboard. Two of the pieces form boxes which telescope one into the other to form the camera enclosure, one of the boxes defining the front side of the camera and the camera aperture, the other box defining the rear side of the camera and a rectangular enlarged opening therein.

The rear side supports a frame adapted to support in turn a commercial cut-film holder, the two boxes being telescopically movable to position a film in the holder at the focal length of the camera aperture. The cardboard sheet also provides a diaphragm in tab form having a plurality of openings



of different diameters positioned lengthwise on the tab, a shutter also in tab form with an opening, and a plurality of strips which can be glued to the front side of the camera to guide the diaphragm and shutter in separate planes across the front of the camera enclosure, with the openings of the shutter and diaphragm alignable with the aperture of the camera. The shutter is actuatable by a rubberband affixed to the camera enclosure, the kit also including cardboard pieces adapted to form a viewing screen holder which can be placed against the rear side of the camera enclosure in place of the commercial cut-film holder.

3,640,196

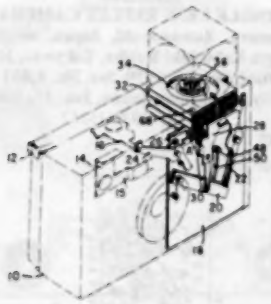
PHOTOGRAPHIC APPARATUS FOR MECHANICALLY ACTUABLE PHOTOFLASH UNITS

David N. Brooks, West Peabody, Mass., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of application Ser. No. 655,468, July 24, 1967, now abandoned. This application Feb. 12, 1970, Ser. No. 10,068

Int. Cl. F21k *5/02, 5/00;* **G03b** *9/70*

U.S. Cl. 95—11.5 R **1 Claim**



An assembly in photographic apparatus for mechanically firing percussively ignitable photoflash lamps preferably contained in a multilamp unit or flashcube. The assembly includes a mechanism responsive, for example, to film winding for sequentially indexing the flashlamps and setting the firing mechanism to prepare the apparatus for firing respective ones of the flashlamps at a firing locus or position. The firing mechanism includes a rapidly movable drive or hammer that is first cocked or set and then released to synchronously effect both ignition of the flashlamp and opening of the shutter.

3,640,197

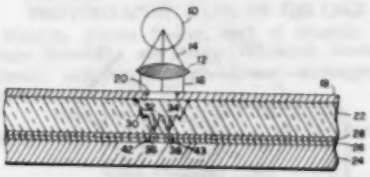
PRODUCTION OF FINE SINGLE LINES AND OF DISCRETE CLOSELY SPACED FINE LINES

Arthur E. Sanera, Mesa, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 22, 1970, Ser. No. 4,842

Int. Cl. G03b *29/00*

U.S. Cl. 95—12 **7 Claims**



An apparatus is provided to produce fine single lines and discrete closely spaced fine lines by use of an opaque mask having relatively wide transparent slits or lines therein. The apparatus includes, besides the mask, a source of monochromatic light and a spacer, which may be transparent, of the correct thickness.

3,640,198

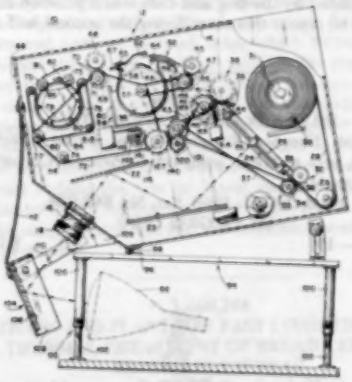
CONTROL APPARATUS AND METHOD FOR A PHOTOGRAPHIC DEVICE

Claire L. James, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 2, 1969, Ser. No. 854,482

Int. Cl. G03b *17/50*

U.S. Cl. 95—13 **17 Claims**



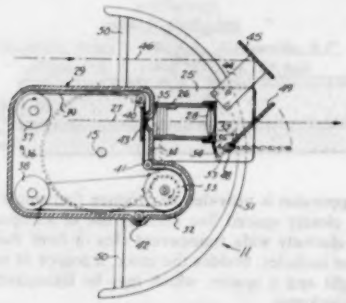
Apparatus for controlling the operation of a processor of photographic materials. More specifically, the control apparatus functions to advance a predetermined length of the sensitized, photographic material from a supply thereof to an exposure station, expose the sensitized material to an image, advance and sever the exposed portion of the sensitized photographic material at a first relatively high velocity and direct the exposed sheet of sensitized material through a heated station at a second slower speed. Further, the first

velocity of the severed sheet is maintained until the sheet is disposed substantially within the processing station to insure that the sheet is uniformly developed. Once the leading edge of the exposed sheet leaves the processing station, the velocity of the sheet of sensitized paper is increased to the first relatively high speed.

3,640,199
PHOTOGRAPHIC SCAN CAMERA USING A PIVOTED MIRROR

Jesse David Wolf, Golden, Colo., assignor to Trans-Horizons, Inc., Ontario, Calif.

Filed June 19, 1970, Ser. No. 47,250
Int. Cl. G03b *37/02*
U.S. Cl. 95—15 **14 Claims**

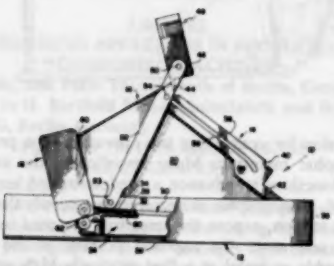


A continuously rotated panoramic camera mounted on a support having a fixed semicircular cam concentric with the axis of rotation of the camera. The camera is provided with an offset angled mirror fixed relative to the camera and with a pivoted mirror carrying a dog engageable with the cam to rotate the pivoted mirror into the field of view of the camera and into a position to receive images reflected from the angled fixed mirror. The parts are so arranged that in the course of a revolution, after the camera has scanned 180° of a scene during the first half of the revolution, the pivoted mirror is rotated by the dog and cam into a position causing the camera to repeat this scan during the second half of the revolution.

3,640,200
FILM-ADVANCING APPARATUS

Lawrence M. Douglas, Eastondale, and Irving Erlichman, Wayland, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 21, 1969, Ser. No. 868,044
Int. Cl. G03b *19/10*
U.S. Cl. 95—19 **8 Claims**

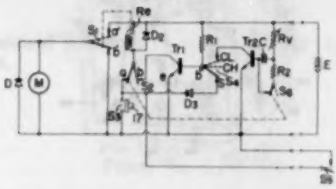


A camera having a support for locating a film unit in position for exposure, a shutter for admitting light into the camera to expose the film unit and a film-advancing member for engaging and moving the film unit subsequent to exposure toward the exterior of the camera. A control is positioned between the shutter and the film-advancing member to enable the latter to advance a film unit from its container subsequent to actuation of the shutter and a disenabling member for preventing the film-advancing member from moving another film unit from the container until the preceding film unit has moved a predetermined distance.

3,640,201
MOTOR-DRIVEN WINDING DEVICE FOR A CAMERA

Shuji Kimura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 24, 1969, Ser. No. 887,827
Claims priority, application Japan, Dec. 28, 1968, 43/96306
Int. Cl. G03b *19/04*
U.S. Cl. 95—31 EL **10 Claims**



A motor-driven device for releasing the shutter, advancing the film and cocking the shutter of a camera, and permitting single frame or continuous exposures to be made. The motor control includes a single switch controlled by a relay coil. The relay coil is includable in and capable of being energized by either of two mutually exclusive circuit paths each including in series, one of the contacts of a two-position changeover switch which selects the particular path for energizing the coil. The motor controls a mechanical arrangement which has two sequences of operation; a first sequence which releases the shutter and places the changeover switch in the second position, and a second sequence which advances the film, cocks the shutter and places the changeover switch in the first position. An operating button is connected in series with the first circuit path and a transistor switch is connected in the second circuit path. A selector switch is connected between the two circuit paths. For single frame exposures the selector switch turns the transistor OFF when the button is depressed. For continuous exposures, the transistor remains ON all the time. A timing circuit is further added for time-delayed continuous exposures.

3,640,202
SINGLE LENS REFLEX CAMERA

Katsuhiko Nomura, Kawagoe-shi, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Jan. 21, 1970, Ser. No. 4,651
Claims priority, application Japan, Jan. 31, 1969, 44/7942
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **5 Claims**

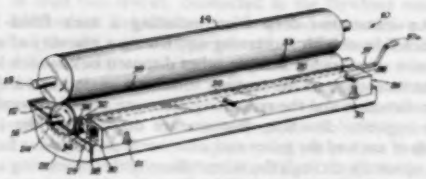
A single lens reflex camera with an automatic preset diaphragm includes a first spring loadable lever for advancing

the camera mirror out of the objective light path and a second spring loadable lever for stopping down the diaphragm. The first lever includes a stop which engages a stop on the second lever to lock it in a retracted position when the first lever is in retracted position and cooperating elements releasably lock the first lever in its retracted position. Upon release, the first lever is spring advanced and advances the mirror and disengages the stops so that the second lever is spring advanced to stop down the diaphragm.

3,640,203
LIQUID DEVELOPING APPARATUS

Lester R. Raab, Greensburg, Pa., and Dennis E. Toby, Lake Zurich, Ill., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Continuation-in-part of application Ser. No. 606,332, Dec. 30, 1966, now abandoned. This application June 9, 1969, Ser. No. 831,399
Int. Cl. G03d *5/06*
U.S. Cl. 95—89 R **13 Claims**

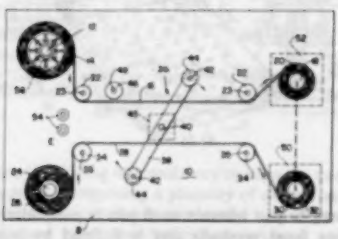


A roller-type developing apparatus with a wiping control for developing sensitized materials. The roller arrangement includes at least an applicator roller and a pressure applying member in contacting engagement forming a developing zone. The wiping control is a rod or blade that wipes controlled amounts of fluid from the applicator roll which has a surface finished to a degree of smoothness expressed in terms of the average depth of randomly formed depressions therein in microinches. An applicator roll having a smoothness of from 10–200 microinches center line average smoothness (or roughness), together with the wiping control, applies less than 3.0 grams liquid per square meter of the copy sheet to provide dry to the touch copies.

3,640,204
PHOTOGRAPHIC WEB PROCESSING DEVICE

Robert A. Gordon, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 6, 1970, Ser. No. 34,953
Int. Cl. G03d *9/00*
U.S. Cl. 95—94 R **3 Claims**

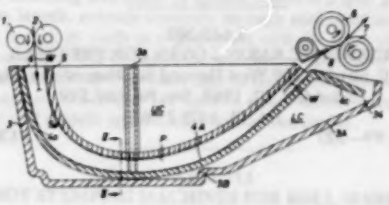


A web processing device in which a web containing a processing ingredient or solution such as a developer is brought into intimate pressure engagement with an exposed film for a predetermined time to effect processing of the film. Transport and guiding mechanisms are provided for the film and web for guiding the film and web in spaced relation through a processing station. Processing is achieved at the processing station by a member movable from a normal retracted position, in which it is out of engagement with the film and web, to a laminating position, in which it moves portions of the film and web into intimate pressure engagement for a predetermined time interval. The web and film are separated upon return of the member to its normal retracted position by the combined action of the tension on the web and the angles of approach and separation defined by the film and web when they are in pressure engagement. An auxiliary separator member may be provided movable between the film and web and across the processing station to separate the film and web.

3,640,205
APPARATUS FOR WET TREATMENT OF PHOTOGRAPHIC FILMS OR THE LIKE

Fritz Waschk; Jurgen Muller, both of Munich; Heinrich Krieger, Starnberg, and Gunter Heindrich, Munich, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 23, 1970, Ser. No. 31,287
Claims priority, application Germany, Apr. 25, 1969, G 69 16 867
Int. Cl. G03d *13/04*
U.S. Cl. 95—95 **8 Claims**



A vessel which contains a supply of treating fluid for webs of photographic films or the like accommodates a guide having a concave upper surface along which a web advances lengthwise to be thereby immersed into the liquid and to continuously withdraw some liquid which is thereupon removed by two squeezing rollers. The thus removed liquid is caused to descend onto an inclined ledge which forms part of the guide and directs the liquid, as well as the impurities contained therein, into the compartment between the bottom wall of the vessel and the underside of the guide. Such compartment communicates with the remaining part of the internal chamber of the vessel by way of apertures provided in the guide and distributed and/or dimensioned in such a way as to at least reduce the rate of liquid circulation between the remainder of the internal chamber of the vessel and that part of the compartment wherein the impurities tend to accumulate by gravity.

3,640,206
PROCESS AND PLANT FOR FAST CONDITIONING OR THERMAL TREATMENT OF BREAD CEREALS, ESPECIALLY WHEAT

Gheorghe Moisescu; Valer Stoica; Carol Wolf, and Nicolae Spataru, all of Bucharest, Romania, assignors to Institutul de Cercetari Si Proiectari Alimentare, Bucharest, Romania

Filed Mar. 28, 1969, Ser. No. 811,420
Claims priority, application Romania, Apr. 1, 1968, 56296
Int. Cl. A23b *9/00*
U.S. Cl. 99—237 **7 Claims**

A process for treating cereals including the steps of fast heating the cereals with steam jets, storing the thus-treated cereals while at the same time mixing them, and then cooling and drying using a countercurrent flow of indirectly and in-

termediately heated air.

A plant for performing the process including in descending

vertical order a prismatic bin for holding untreated cereal, a cereal fast heating and storage apparatus, a cooler-drier, and a metering device.

3,640,207

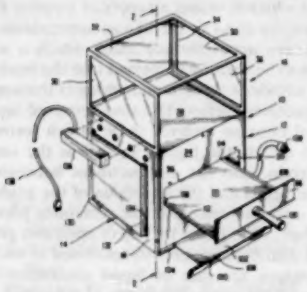
AUTOMATIC BAKING OVEN FOR PRETZELS

George E. Snyder, 539 West Howard St., Hagerstown, Md.

Filed Oct. 27, 1969, Ser. No. 869,590

Int. Cl. A47j *27/62*

U.S. Cl. 99—327 3 Claims



A merchandising pretzel baking oven has a vertical casing defined by a lower rigid wall portion and an upper transparent wall display case with a horizontal partition wall therebetween. The lower portion has a baking chamber constituted by upper and lower sections of truncated rectangular base pyramidal shape horizontally fixed therein with timer controlled electrical heating rods mounted at the closed top wall of the upper section and at the open bottom wall of the lower chamber. A baking tray adapted to contain frozen pretzels is slidably supported by the lower portion and is movable into and from the oven chamber horizontally intermediate the sections thereof through one wall of the lower portion with a cleanout tray, arranged below the oven chamber, being also slidable in such wall. The other walls of the lower portion have combined heat insulating and illuminated advertising display panels provided on their outer faces.

3,640,208

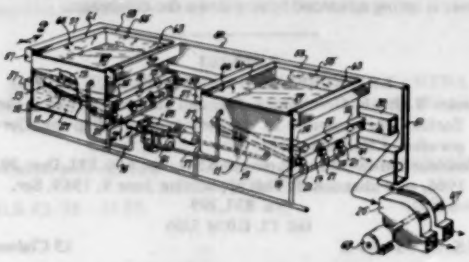
IMMERSION DEEP FRIER

Robert A. Size, 1250 West 130th, Gardena, Calif.

Filed Aug. 4, 1969, Ser. No. 847,041

Int. Cl. A47j *37/12*

U.S. Cl. 99—408 7 Claims



An immersion deep frier including a tank filled to a selected level with shortening and having a plurality of coextensive open-ended heating tubes disposed below such level. Alternate ones of the heating tubes are angled upwardly in one direction and the remaining tubes are angled upwardly in the opposite direction. Burners are disposed at the lower ends of each of the tubes and a blower is provided for forcing air upwardly through the tubes whereby the shortening at the lower ends of the tubes will be heated and caused to expand thereby moving inwardly along the respective tubes to approximately the center of the tank where it will encounter currents moving along the adjacent oppositely angled tubes and will rise upwardly and be turned outwardly to travel to the outer periphery of the tank where it will turn downwardly and inwardly to again commence travel inwardly along the respective tubes thereby providing a number of small currents circulating in the tank to prevent burning of the shortening and provide uniform agitation and circulation of foodstuffs disposed in the tank.

3,640,209

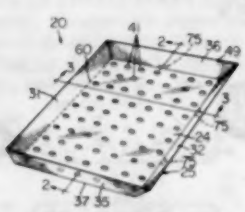
PAN HAVING ARTICLE-SUPPORTING WALL ABOVE BOTTOM WALL

Calvin L. Wilson, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed July 24, 1969, Ser. No. 844,442

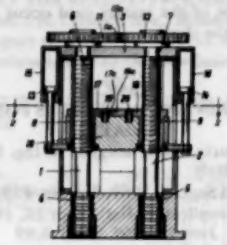
Int. Cl. A47j *35/00*

U.S. Cl. 99—446 33 Claims



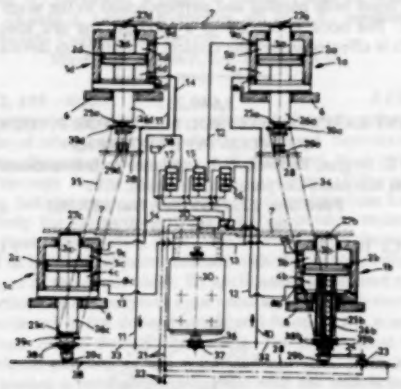
A disposable pan wherein such pan is particularly adapted for broiling food products and is defined by laminating a layer of metallic foil to a layer of a comparatively inexpensive nonmetallic material. The pan has metallic foil defining practically its entire exposed inside and outside surfaces and has an article-supporting wall arranged above a bottom wall with a space provided therebetween for collecting juice, or the like, exuding from a product contained in the pan.

3,640,210
MULTIPLE-SCREW FLY PRESS
Otto Georg, Ostatrasse 12, 5802 Breckerfeld, Germany
Filed July 18, 1969, Ser. No. 842,944
Int. Cl. B30b 15/28
U.S. Cl. 100—53 12 Claims



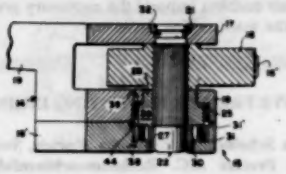
The fly press comprises a flywheel means and, in combination, at least two screws, connected to the flywheel means, ram drive means for at least one ram, and at least two nuts mounted in said ram and peripherally movable and axially immovable in said ram. Overload-preventing means are arranged between said nuts and said ram and are adapted to be nonresponsive to torques below a minimum torque between said nuts and ram, so that such torques will be fully transmitted, whereas the overload-preventing means are responsive to torques which are higher than the minimum torque so that such higher torques will not be transmitted.

3,640,211
HYDRAULIC DEVICE FOR MOVING IN TRANSLATION THE PRESSING ELEMENT OF A PRESS OR THE LIKE
Vittorio Louis Achille Bianchi, 37, Avenue Paul, Doumer, Paris; 16°, France
Filed Dec. 19, 1969, Ser. No. 886,646
Claims priority, application France, Dec. 17, 1969, 181043
Int. Cl. B30b 15/24
U.S. Cl. 100—258 5 Claims



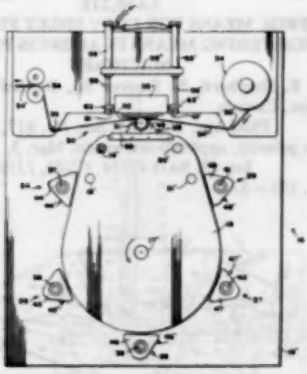
A device for driving in translatory motion the pressing element of a press, comprising a plurality of double-acting rams having their rods operatively connected to said pressing element said rams being hydraulically connected in series to each other, so that the driving of the piston of the first ram by a pressure fluid causes the rams to be fed by each other and the simultaneous sliding motions of their pistons, and means to keep constant the volume of hydraulic fluid contained in the front chamber of a ram and in the rear chamber of another ram with which it is connected.

3,640,212
ROTARY MARKING TOOLS
Jerome Friedman, 19 The Glenada, Roslyn, N.Y.
Filed Apr. 16, 1969, Ser. No. 816,586
Int. Cl. B41f 13/10; B44b 5/02
U.S. Cl. 101—7 6 Claims



A journaled hollow main shaft which is an internal gear having many teeth, has thereabout a spiral spring arranged to bias it to a normal rest position, and also a helical coil spring clutch allowing shaft rotation in a direction to stress the spiral spring, but normally restraining said shaft against reverse movement. The marking wheel is also an internal gear whose position is between the arms of a clevis which is the tool body. One clevis arm is a casing housing said springs and mounting said shaft. A spindle which is a spur gear most of its length, extends coaxially through said shaft and wheel, and has all its teeth in engagement with the teeth of said internal gears, but is separable therefrom by relative longitudinal movement. The other arm of the clevis offers a bearing to support one end of the spindle and a means to releasably hold said spindle against longitudinal movement.

3,640,213
HOT STAMPING MACHINES FOR ROLL MARKING CYLINDRICAL ITEMS
Morin Schwartzbach, No. 89-06 218th St., Jamaica, N.Y.
Filed May 9, 1969, Ser. No. 823,454
Int. Cl. B41f 17/08
U.S. Cl. 101—8 11 Claims



In the machine shown, a series of upright, parallel, equispaced rotatable spindles, which for tubular workpieces serve as the mandrels therefor, extend from individual bearings carried by a constantly moving, substantially horizontally mounted link chain belt, a portion of whose path is straight, wherealong workpieces associated with the spindles, in succession, pass a marking station presenting a

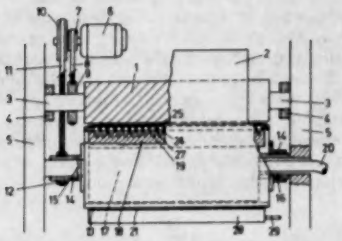
heated flat die whose face is upright and has thereacross a colored foil. In their passage along the die, the workpieces are roll marked thereby, but they are rotated by a positive drive, independent of contact with the die. Said die is allowed some wobble, but each bearing is held so the axis of its spindle is maintained in a fixed direction during passage along the marking station, and there is a means associated with each spindle, to adjust the peripheral speed of the workpiece in relation to the speed of said chain. An adjustably pressurized air cushion imparts the necessary pressure the die imposes on the work rolling thereon.

3,640,214

SELECTIVE PRINTER EMPLOYING INKING SPARK DISCHARGE

Hans-Jurgen Scheinhutte, Dietlikon, Zurich, Switzerland, assignor to Precisa A.G. Rechenmaschinenfabrik, Zurich, Switzerland

Filed June 11, 1969, Ser. No. 832,088
Claims priority, application Switzerland, June 21, 1968, 9254/68
Int. Cl. B41j *5/00*; **B41m** *5/02*; **B41j** *3/22*
U.S. Cl. 101—45 **8 Claims**



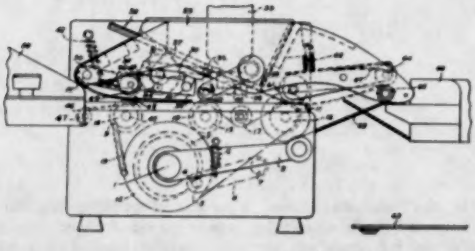
A metal foil containing capillary holes filled with ink and defining the character to be printed is placed so that the holes cover the opening of a chamber having two electrodes which are sparked to raise the pressure in the chamber and so to push the ink out of the holes and against an adjacent web of paper.

3,640,215

CONTROL MEANS FOR COPY SHEET FEEDING AND MOISTENING MEANS IN ADDRESS PRINTING MACHINES

George E. Shepherd, 51 Pasteur St., Dollard Des Ormeaux, Quebec, Canada

Filed Apr. 18, 1969, Ser. No. 817,310
Claims priority, application Canada, Mar. 3, 1969, 044,513
Int. Cl. B41l *47/24, 47/46, 11/02*
U.S. Cl. 101—53 **6 Claims**



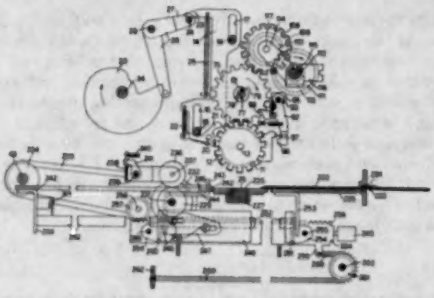
A spirit transfer printing machine has a drive shaft for rollers which pass a copy sheet from a receiving station through a printing station, the sheet being initially held at the receiving station by retractable positive stops. A countershaft driven by the drive shaft simultaneously actuates a moistener for a selected area of the sheet and a mechanism for superposing a master card on the moistened area for printing at the printing station. An adjustable drive mechanism between the countershaft and the drive shaft enables actuation of the moistener and card superposing mechanism to be preadjusted relative to feeding of the copy sheet so that moistening and superposition of the master card occur at an adjustably selected area of the sheet.

3,640,216

PARALLEL PRINTING APPARATUS FOR RECORDED DATA

Bruno Piazza, Turin, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Turin, Italy

Filed Sept. 4, 1969, Ser. No. 855,082
Claims priority, application Italy, Sept 26, 1968, 53271-A/68; June 21, 1969, 52331-A/69
U.S. Cl. 101—93 C **20 Claims**



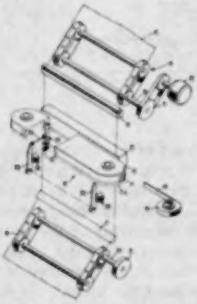
A parallel printing apparatus for data recorded in a store comprises a set of type wheels sequentially set up by a setting wheel, which is transversely moved step by step and is variably rotatable according to the code recorded for each type wheel. The setting wheel is rotated through a clutch which is held engaged under the control of a step counting device sensing a toothed wheel rotated synchronously with the setting wheel. The apparatus is adapted to print on a bank book both parallel and perpendicular to the seam of the book. The book is carried by a carriage, the line spacing of which is effected under the control of a program device.

3,640,217

PRINT HAMMER CONTROL MEANS FOR PIVOTALLY MOUNTED-TYPE MEMBERS

John E. Drejza, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,203
Int. Cl. B41j *9/14, 9/28*
U.S. Cl. 101—93 C **7 Claims**



A printer has a plurality of print hammers which impact pivotal-type levers carried by type carriers moving along a

track adjacent the print line. Cam surfaces on the body of the carrier cooperate with portions of the print hammer to prevent interference between the print hammer and an adjacent type lever when printing.

3,640,218

SEAL ASSEMBLY FOR SLEEVE-TYPE GRAVURE ROLLS

Thomas K. Allison, 590 Camden Ave., Moorestown, N.J.

Continuation-in-part of application Ser. No. 814,658, Apr. 9, 1969, now abandoned. This application June 25, 1970, Ser. No. 49,771

Int. Cl. B41f *13/20*; **B21b** *27/00, 31/32*

U.S. Cl. 101—375 **5 Claims**

A seal assembly for sealing a sleeve-type gravure roll to prevent ink penetration between the roll end members and the sleeve. Each seal assembly includes an inwardly beveled conical surface on the end member, a resilient seal ring disposed adjacent the conical surface, a pressure ring disposed adjacent the sealing ring, and a winding of pneumatic tubing located inwardly of and adjacent the pressure ring. Inflation of the tubing forces the pressure ring against the sealing ring and expands the sealing ring outwardly along the conical surface of the end member into engagement with the inner surface of the sleeve end, the sealing ring being elastically deformed so as to completely fill the space between the sleeve end and the end member to prevent penetration of ink beneath the sleeve.

3,640,219

METHOD OF DRY PREPARATION OF RELIEF PRINTING PLATES

Norman W. Farnham; William J. Mueller, both of Webster, and Donald J. Gorall, Rochester, all of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 4, 1969, Ser. No. 847,148

Int. Cl. B41c ; B41n

U.S. Cl. 101—401.1 **5 Claims**

An improved method for preparing relief printing plates by transfer of selected portions of a dry, uncured, heat-sensitive polymer dispersion layer from a donor sheet to a printing plate through fusion under infrared radiation. Infrared-absorbing indicia are deposited on a printing plate base having an affinity for fusion with the polymer dispersion under infrared heat. The printing plate base having indicia thereon is placed in intimate physical contact with the polymer dispersion layer of the donor sheet. By application of infrared energy, portions of the polymer dispersion layer are polymerized and hardened in the desired image and fused to the printing plate base to and through the indicia. The donor sheet with the unfused portions of the polymer dispersion, peels away easily leaving a finished printing plate with the indicia incorporated therein.

3,640,220

MATCHED PLATE METHOD FOR PRINTING ON MULTIPLE PAPER PARTS

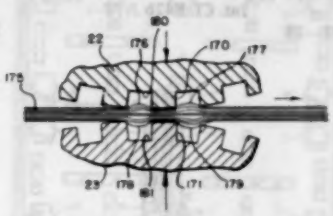
James B. Fulk, 18309 Lexington Drive, Monte Sereno, Calif.

Filed Mar. 23, 1970, Ser. No. 21,948

Int. Cl. B41f *5/04*

U.S. Cl. 101—426 **3 Claims**

A method and apparatus for making graphic copies of indicia, lines, or designs on multiple paper parts which are impressed in unison between the members of a printing couple. The printing members may be in cylindrical form for a rotary printing press or in plate form for a flatbed press. Each member of the printing couple has embossed surfaces which



represent the indicia, lines, or designs to be printed. The embossing on one of the members is the mirror reverse of the embossing on the other member and the embossing characters are disposed in exact matching relationship. The printing operation is known as "crash" printing.

3,640,221

PLANOGRAPHIC PRINTING PLATE

Edward R. Wyke, Chelmsford, Mass., assignor to Litton Business Systems, Inc., New York, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,634

Int. Cl. B41n *1/00, 3/00*

U.S. Cl. 101—453 **2 Claims**

A planographic printing plate comprising a base having adhered thereto an insolublized coating, including a pigment mixture containing zirconium silicate so as to enhance rejection of ink in nonimaged areas of the plate

---

3,640,222

BOOSTER-CAP ASSEMBLY

Donald P. Graham, Hurley, N.Y., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 27, 1968, Ser. No. 787,413

Int. Cl. F42b *3/10*

U.S. Cl. 102—24 **13 Claims**

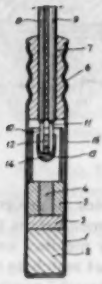
A booster unit containing a small base charge, and adapted to slip over the end of a cap-, or fuse-, type primary initiator to support the base charge in detonating relationship with the primary initiator; and resulting combination of booster unit and the primary initiator as a new booster assembly. The invention is advantageously applied to the elimination of need for conventional dynamite, or cast booster charge, primers for shooting relatively insensitive explosives such as those of the aqueous inorganic oxidizer slurry types, and ANFO's.

3,640,223

ELECTRIC BLASTING CAP HAVING INCREASED SAFETY AGAINST UNINTENTIONAL INITIATION

Per O. I. Olsson, Gyttorp, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

Filed Oct. 1, 1968, Ser. No. 764,069
Claims priority, application Sweden, Oct. 6, 1967, 13698/67
Int. Cl. F42b *3/18*
U.S. Cl. 102—28 2 Claims



The present invention concerns an electric blasting cap having increased safety against unintentional initiation, said blasting cap presenting a bridge wire and in contact with said bridge wire a fuse head composition which latter is surrounded by a protective tubing of dielectric material.

3,640,224

RF IMMUNE FIRING CIRCUIT EMPLOYING HIGH-IMPEDANCE LEADS

John T. Petrick, and Reginald I. Gray, both of Fredericksburg, Va., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 12, 1969, Ser. No. 857,443
Int. Cl. F42b *3/18*
U.S. Cl. 102—28 7 Claims

High-impedance leads in a firing circuit prevent radiofrequency induced currents from prematurely detonating the electroexplosive device. A capacitor across a serial arrangement of an electroexplosive device and an SCR permits the use of a standard size power source to detonate the (EED) electroexplosive device, notwithstanding the impedance introduced by the interference preventing leads.

3,640,225

FUZE APPARATUS

Donovan R. Carlson, and William O. Maruska, both of Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed June 20, 1969, Ser. No. 835,186
Int. Cl. F42c *15/26*
U.S. Cl. 102—79 3 Claims

A centrifugally displaced fluid barrier for a spin-operated fuze arming delay. Safing and delay arming is provided by a relatively high density fluid positioned along the spin axis of a munition to block the output of a detonator along the spin axis. The fluid completely fills a chamber with the exception of a relatively small volume air bubble. Under sustained spin environment, the air bubble is displaced by centrifugal forces within the fluid into a position along the axis of the munition, allowing the detonator output to pass through the air

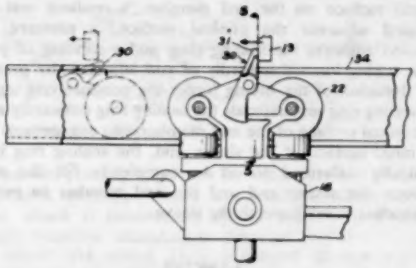
chamber. Various configurations of the chamber to provide arming delay are contemplated.

3,640,226

CONVEYOR SYSTEM

Paul Klamp, St. Clare Shores, Mich., assignor to American Chain & Cable Company, Inc., New York, N.Y.

Filed Aug. 28, 1969, Ser. No. 853,845
Int. Cl. B65g *17/42*
U.S. Cl. 104—96 8 Claims



A conveyor system including a first load supporting track and a second load supporting track with an intermediate transfer portion. A powered conveyor is provided in association with each of the first and second tracks. A plurality of carriers are provided. Each of the carriers has a first dog that is in position for normal engagement with the pusher member of the conveyor and a second dog that is normally urged to an operative carrier pushing position but is held by the track out of operative position. At a transfer point a portion of the track is cut away to permit the second dog to move to operative carrier transferring position.

3,640,227

RAIL CAR AND SUPPORTING TRACK AND SWITCH SYSTEM

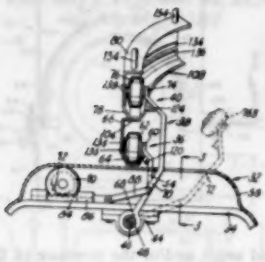
Austin A. Webb, 337 Espanola Ave., Kalamazoo, Mich.

Filed May 28, 1969, Ser. No. 828,685
Int. Cl. E01b *25/06*
U.S. Cl. 104—130 8 Claims

A rail car having two sets of supporting wheels swingable to upright operative car supporting positions at different elevations above the car, from laterally displaced inoperative positions; a track system having rails that converge and diverge at junction points, parallel reaches in said rails at the incoming ends of the junction points spaced vertically to support one set of wheels and register in unsupporting relation to the other set of wheels while the other wheels are moved into registry with the other track, vertically divergent portions at the ends of the parallel reaches arranged to transfer the support of the car from one set of wheels to the other, and selectively operable means to swing the sets of wheels to operative position to effect switching of the car from one rail

to the other at transfer points.

A refinement shows stretches of rails at an intermediate

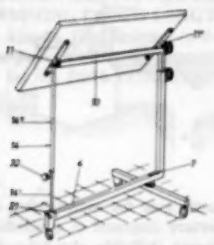


spacing, along which the car may be supported and driven by both sets of wheels, for high-speed operation.

3,640,228
ONE-COLUMN TABLE

Fritz Busse, Solingen-Ohligs, Germany, assignor to Firma Bremshey & Co., Solingen-Ohligs, Germany

Filed Oct. 8, 1969, Ser. No. 864,614
Claims priority, application Germany, Mar. 1, 1969, P 19 10 593.2; Apr. 2, 1969; P 19 16 952.9; Apr. 18, 1969, P 19 19 714.9; May 30, 1969, P 19 27 616.5; June 4, 1969, P 19 28 416.3
Int. Cl. A47f 5/12; A47b 85/00
U.S. Cl. 108—6 **10 Claims**



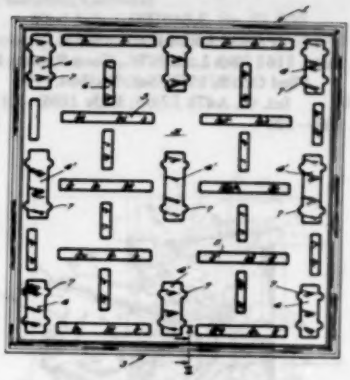
A one-column table which comprises a table column telescopically variable as to its length, and a foot-arm projecting from said table column. A horizontal arm supports a table top and likewise projects from the table column to the horizontal arm. A supporting stay is coordinated for the support of the free end of the horizontal. The horizontal arm, the foot arm and the table column constitute table members. Means are provided for permitting movement of the supporting stay from a coaxial position relative to one of said members into a supporting position.

3,640,229
PALLET

Joseph P. Bell, Route 83, Grayslake, Ill.

Filed Oct. 6, 1969, Ser. No. 863,991
Int. Cl. B65d 19/18
U.S. Cl. 108—58 **10 Claims**

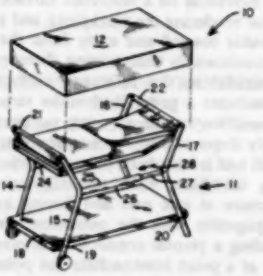
A pallet constructed from formed sheet material, such as a plastic sheet, having a generally planar load-supporting member from which downwardly depend hollow leg members and hollow stiffening members, the leg and stiffening members being of such configuration and dimensions and so disposed that sufficient rigidity is imparted to said load-supporting member that the latter is relatively undeformable under normal loads thereon.



3,640,230
FOLDABLE IRONING BOARD

Donald J. Munson, Minneapolis, Minn., assignor to North Central Manufacturing Corporation, Minneapolis, Minn.

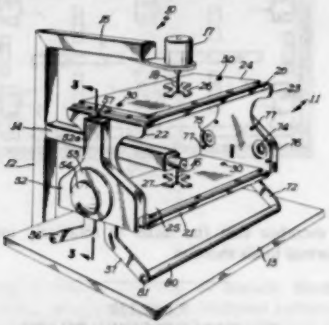
Filed Nov. 30, 1970, Ser. No. 93,576
Int. Cl. A21b 1/06
U.S. Cl. 108—63 **11 Claims**



An elongated collapsible table structure suitable for use as an ironing board or the like, and comprising in combination, support frame means and a plurality of table forming segments, the segments being hingedly secured together and arranged to be disposed in a first collapsed disposition and a second extended disposition. Cover means are provided for covering or enclosing the structure while in collapsed disposition, the cover means providing a decorative or utilitarian purpose. The support frame means include a plurality of legs supporting a pair of generally axially parallelly disposed laterally spaced mounting rails and means are provided for accommodating relative lateral reciprocatory to-and-fro shifting of the mounting rails along a direction transverse to the rail axes, and means are provided for mechanically biasing said frame means and urging said mounting rails toward one another. The table forming segments include a central segment along with tip and butt segments, the tip and butt segments each being secured to the mounting rails with mounting brackets at a point adjacent the juncture with the central segment, the mounting brackets being arranged for pivotal arcuate rotation about the mounting rails between the collapsed disposition and the extended disposition, with the length of the arm of the mounting brackets providing for sig-

nificant differences in elevation for the table between the collapsed disposition and the extended disposition.

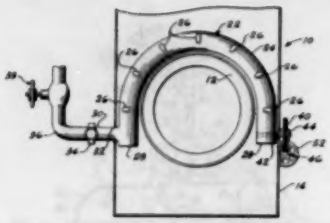
3,640,231
PARALLEL MECHANISM
John O. Lenz, 1161 98th Lane N.W., Coon Rapids, Minn.
Filed Oct. 8, 1969, Ser. No. 864,770
Int. Cl. A47b *57/06*; B23c *1/16*
U.S. Cl. 108—106 **16 Claims**



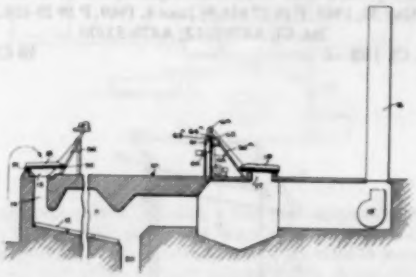
A carving apparatus including a spaced axially aligned tool and tracer and parallel mechanism including two spaced surfaces for carrying a workpiece and a pattern and for simultaneously presenting the pattern and workpiece to the tracer and tool, respectively. The parallel mechanism includes a base portion moveable on a reference surface and includes a mechanism for rendering the workpiece and pattern-carrying surfaces movable toward and away from the reference surface while continuously maintaining them parallel to each other and parallel to the reference surface. The parallel mechanism includes a generally boxlike structure including the pattern and workpiece carrying surfaces and identical and oppositely disposed endpieces connecting those two surfaces. At each end it includes a pair of identical and reversely disposed leg members, each pivotally connected to the boxlike structure at one end and having an opposite end operably engageable with the reference surface, and with means providing a pivotal connection between the two legs of each pair at a point intermediate the point at which they are pivoted to the boxlike structure and their opposite ends. The pivot point between the two legs of each pair is movable generally normal to the reference surface and is spring biased in one direction and movable against the spring in the opposite direction. An alternative embodiment includes selectively adjustable means for limiting the movement of the mechanism in a direction normal to the reference surface.

3,640,232
HIGH MOISTURE CONTENT FUEL DISPERSION APPARATUS
Joseph F. Mullen, West Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Sept. 19, 1969, Ser. No. 859,379
Int. Cl. F23g *7/00*
U.S. Cl. 110—7 R **6 Claims**

A method and apparatus for distributing high moisture content material fuel within the furnace of a steam generator organization, said fuel being transported to the furnace pneumatically. An angularly adjustable manifold having series of nozzles is located adjacent the discharge end of the fuel transport line at the point where it enters the furnace. Jets of a dispersion medium supplied to the manifold are directed through the nozzles to apply horizontal and vertical force components to the solid fuel particles issuing from the transport line. The dispersion pattern may be regulated by adjusting the manifold angle and/or the pressure of the dispersion medium.



3,640,233
INCINERATOR SHIFTABLE CLOSURE GATE
Joel Russell Reiner, Philadelphia; William J. Preusch, Southampton, and William G. Davenport, Philadelphia, all of Pa., assignors to Beaumont Birch Company, Philadelphia, Pa.
Filed Oct. 8, 1970, Ser. No. 79,038
Int. Cl. F23g *3/00*
U.S. Cl. 110—8 R **24 Claims**



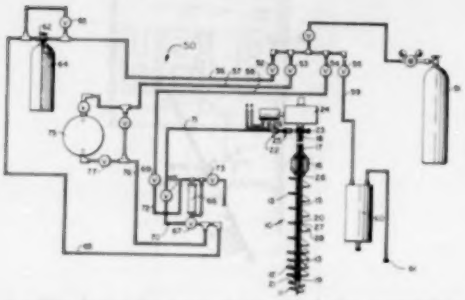
A wheeled closure gate for maintaining opened or closed as desired an aperture disposed in a substantially horizontal plane, the gate being shiftable along tracks embracing the aperture which are so relatively inclined with respect to the horizontal plane as to permit the gate to be moved upwardly along said tracks by power means into aperture-opening position and return thereof by gravity into aperture-closing position. The closure gate in this particular instance comprises a flat plate assembly which is bodily shifted from its aperture-closing position, as across the top of a charging hopper or across the top of an exhaust port, into an inclined position located immediately adjacent to one end of the aperture to completely expose the same for flow of material therethrough. Means are provided to controllably hold the gate in its power-operated raised position and to release it for gravity return to its lowered position. The tracks for and roller wheels of the gate are protected against the accumulation of debris thereon as might interfere with free movement of the gate. The gate when raised into its open position serves, when employed as a cutoff gate for an incinerator charging hopper, to deflect back into the hopper rubbish which would otherwise not be received by the hopper. The opposite sidewalls of the hopper may be also provided with swingable side covers which serve to shield the tracks and wheels of the gate from debris collecting thereon and to deflect back into the hopper rubbish spilling over the sidewalls of the hopper.

3,640,234

FUMIGANT INJECTION APPARATUS

William J. Carroll, West Lafayette, Ind., and Frank S. Mizusawa, Garden Grove, Calif., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed May 1, 1970, Ser. No. 33,709
Int. Cl. A01c 23/02
U.S. Cl. 111—6 6 Claims



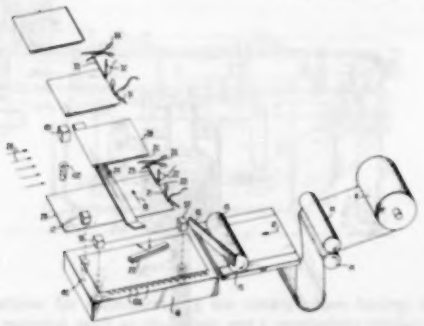
A system is disclosed for forming, filling and sealing capsules of volatile fumigant at least 3 feet underground. The system utilizes an apparatus which penetrates to the prescribed depth, forms a cavity at that depth, fills the cavity and withdraws sealing the filled cavity encapsulating the fumigant at the prescribed depth. The apparatus is particularly useful in combating pathogenic fungi such as *Armillaria Mellea*.

3,640,235

METHOD AND APPARATUS FOR CUTTING AND HEMMING CLOTH LENGTHS

Perry E. Burton, Atlanta, Ga., assignor to Burton & Noonan

Filed June 5, 1970, Ser. No. 43,756
Int. Cl. D05b 33/00, 35/08
U.S. Cl. 112—121.29 10 Claims



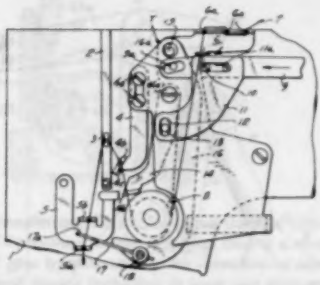
A method and apparatus for cutting and hemming cloth lengths wherein a continuous supply of cloth is fed along a first path to a cutting and transfer station, a predetermined length of cloth is cut from the supply and transferred to a second path extending approximately at a right angle to the first path, a first cut end of the cloth length is hemmed, the cloth length is folded across its length so that its second cut end overlaps the hemmed end, and the second cut end is hemmed.

3,640,236

THREAD RETAINER FOR SEWING MACHINES

Karl Nicolay, Bielefeld, Germany, assignor to Durkoppwerke GmbH, Bielefeld, Germany

Filed July 1, 1970, Ser. No. 51,530
Claims priority, application Germany, July 3, 1969, P 19 33 780.5
Int. Cl. D05b 49/00
U.S. Cl. 112—243 10 Claims



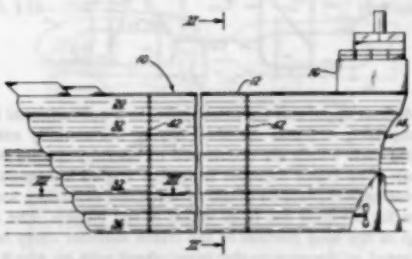
A double-lockstitch sewing machine, provided with a thread-cutting mechanism, has a thread retainer for supplying a predetermined thread length of upper thread at the conclusion of a stitching operation and as a preliminary to a subsequent stitching operation. The retaining arrangement includes a thread brake which is released at the end of the stitching operation and an eye for drawing the released thread from a spool or other supply to provide the desired length.

3,640,237

MULTICYLINDER VESSEL FOR TRANSPORTATION OF FLUIDS

Rex V. Phelps, Tulsa, Okla., assignor to Warren Petroleum Corporation, Tulsa, Okla.

Filed Apr. 23, 1970, Ser. No. 31,115
Int. Cl. B63b 25/16; B63g 8/00
U.S. Cl. 114—16 R 9 Claims



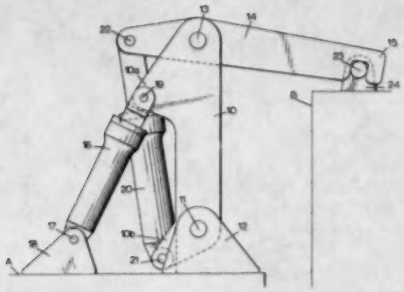
Surface vessels and submarines for the transportation of large volumes of fluids are constructed of a plurality of cylindrical segments joined along their edges. The cylindrical segments serve both as the wall of the storage tanks in which the fluids transported are contained and the skin of the vessel. Webs joined to the junctures of the cylindrical segments extend across the interior of the vessel and are joined to junctures of cylindrical segments on the opposite side of the vessel.

3,640,238

MEANS FOR DRAWING TOGETHER AND ALIGNING THE SEPARABLE PARTS OF COMPOSITE LOAD-CARRYING VESSELS OR WATERCRAFT

Geoffrey Stockdale, 57, Greenleas Road, Wallasey, England

Filed Feb. 13, 1970, Ser. No. 11,082
Claims priority, application Great Britain, Feb. 15, 1969, 8,357/69
Int. Cl. B63b *21/58*
U.S. Cl. 114—235 A 3 Claims



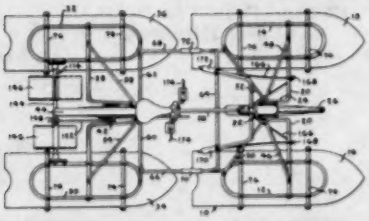
The invention provides power operated apparatus for pulling into alignment both with respect to draft and trim buoyant hull sections of composite vessels and the like. The apparatus comprises in association with a first hull section a power operated extendible and retractable articulated structure, gripping means provided on said extendible and retractable structure, and an anchoring point on a second hull section arranged so as to be engageable with said gripping means.

3,640,239

FLOAT APPARATUS FOR BICYCLE

Paul P. Petroskey, 1121 Chicago Ave., Hammond, Ind.

Filed May 27, 1970, Ser. No. 40,888
Int. Cl. B63b *35/38*
U.S. Cl. 115—27 7 Claims



A float apparatus for attachment to a conventional bicycle comprising a frame member having horizontally extending distal ends which are connected to laterally spaced pontoon floats. The frame member is acutely angled intermediate the distal ends thereof to obtain a vertically extending loop portion for bridging the front wheel of the bicycle. The upright legs of the loop portion of the frame member carry brackets adapted to connect to the front wheel axle by which means the front portion of the float apparatus is attached to the bicycle. A similarly formed second frame member is provided to support a second pair of pontoon floats laterally spaced apart. A horizontally positioned axle is connected between the second pair of float members and is provided with paddle wheels and a sprocket gear. A sprocket chain connects a sprocket on the rear wheel of the bicycle and the sprocket on the paddle wheel axle and is driven by pedaling the bicycle. A swivelly connected rubber device is clamped to the nadir part of the front wheel and is movably controlled by lines strung to the handlebars.

3,640,240

FIN-PROPELLED WATERCRAFT

Erich Stein, 2, Josef-Graber-Gasse, A-5020 Salzburg, Austria

Filed Oct. 23, 1969, Ser. No. 868,771
Claims priority, application Austria, Mar. 7, 1969, A 2256/69; Sept. 8, 1969, A 8486/69
Int. Cl. B63h *1/36*
U.S. Cl. 115—28 5 Claims

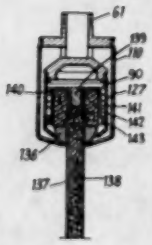
A floating body is operable to rock about a predetermined axis. A torsion-elastic fin stem is mounted on the floating body and substantially intersects the axis and has a free end portion extending from this body. A fin is secured to the free end portion and adapted to produce a thrust in response to a rocking motion of the body about the axis.

3,640,241

WARNING DEVICE FOR CYLINDERS FOR LIQUEFIED GAS UNDER PRESSURE

Marie-Francoise Adaglio, 31 rue des Deux Ponts, Paris 4 eme, France

Continuation-in-part of application Ser. No. 680,821, Nov. 6, 1967. This application Apr. 1, 1969, Ser. No. 812,260
Claims priority, application France, Dec. 29, 1966, 89,270; May 17, 1967, 106,656; July 7, 1967, 113,291
Int. Cl. G01f *23/00*
U.S. Cl. 116—109 5 Claims

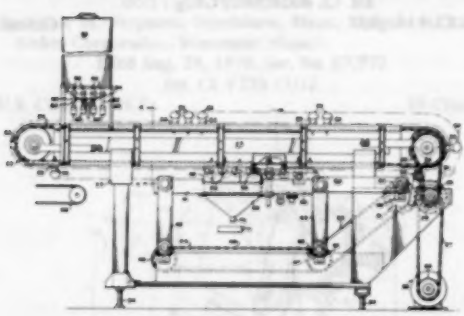


A warning device for a cylinder of liquefied gas under pressure for indicating to the operator when the level of gas in the cylinder is getting low, having a sleeve supported in the interior of the cylinder by a coupling connected to the tap of the cylinder and through which gas flows from the cylinder and which is closed off when the liquid falls below a predetermined level so that the consequent drop in pressure in the chamber sets a valve member into oscillation establishing a warning signal.

3,640,242
SIGNAL FLAG
Frank Guinn, 1305 Allen Ct., and George P. Baba, 1204 Purdue, both of Modesto, Calif.
Filed Nov. 4, 1970, Ser. No. 86,699
Int. Cl. G09f 17/00
U.S. Cl. 116—173 1 Claim

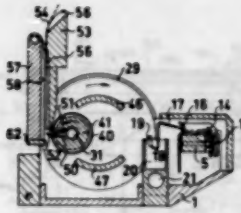
A safety device for water skiers, the device comprising a flag secured to a dowel which can be waved from a boat to warn other boats that a towed skier is down in the water, the flag upon its outer side being painted bright orange, the flag being able to be turned inside out so to change colors.

3,640,243
MACHINE FOR MANUFACTURING A NOVELTY ICE CREAM PRODUCT
Harry L. Dill, and Richard D. Collins, both of Baltimore, Md., assignors to Maryland Cup Corporation, Owings Mills, Md.
Filed Aug. 12, 1970, Ser. No. 63,109
Int. Cl. B05c 5/00
U.S. Cl. 118—24 10 Claims



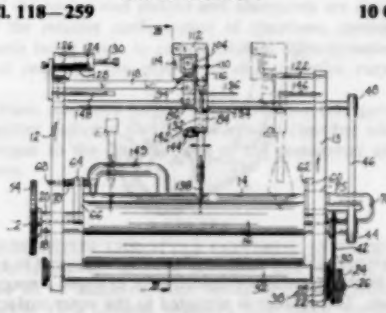
A machine for manufacturing ice cream cones having a coating material, such as chocolate and a particulate confectionary material such as crushed nuts, comprises a conveyor for linearly conveying the ice cream cones in upside down position. A tank for holding a coating material such as melted chocolate, is mounted below the conveyor for oscillation vertically relative to the path of travel of ice cream cones. The coating material in the tank contacts the exposed surfaces of the ice cream on each cycle of oscillation. A chamber is mounted for cooscillation with the tank for cyclically enclosing the coated ice cream balls of the ice cream cones. Means are provided for aspirating within the chamber particulate confectionary material, such as crushed nuts, against the coated surfaces of the ice cream cones.

3,640,244
GLUE-TRANSFERRING DEVICE
Sabud Axelsson, Vallingby, Sweden, assignor to Arenco Aktiebolag, Stockholm-Vallingby, Sweden
Filed Sept. 2, 1970, Ser. No. 69,016
Claims priority, application Sweden, Sept. 8, 1969, 12,349/1969
Int. Cl. B05c 1/00
U.S. Cl. 118—212 6 Claims



1. A glue-transferring device for rapid transfer onto a web of material (54) moving in one direction during a work cycle of a strand of glue transversely to the direction of movement of said web, said device including at least one glue-absorbing surface (55) adapted to be moved between a glue-taking-up station and a glue transfer station and formed on a glue-transferring member (52) mounted on a rotatable body (40), said glue-absorbing surface (55) having a length, calculated in the axial direction of said rotatable body (40), corresponding to the length of the strand of glue, characterized in that said rotatable body (40) is connected to a planetary wheel (38) on a planetary gear bearer (32) which is coupled to driving means (45) adapted to impart to the planetary gear carrier a rotative movement said planetary wheel (38) being in engagement with inner teeth on a fixed ring gear (36) the gear ratio between said planetary wheel and said ring gear being selected so as to cause the glue-transferring member (52) during the rotational movement of the rotatable body (40) to be directed towards, alternately, the glue-taking-up station for taking up glue and the web of material (54) for delivery of the taken-up glue.

3,640,245
CIRCULATING DEVICE
Charles F. Schaefer, Captain's Drive, Pilot's Point, Westbrook, Conn.
Filed Jan. 9, 1970, Ser. No. 1,797
Int. Cl. B05c 1/08
U.S. Cl. 118—259 10 Claims



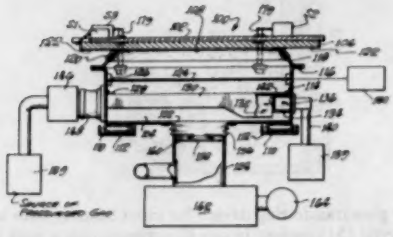
This disclosure relates to a device for preventing adhesive in an adhesive coating mechanism from thickening and decreases the problem of air drying of such adhesive. A mechanism is provided to constantly recirculate liquid adhesive which is deposited between a pair of cooperating rolls so that excess liquid is removed from between the rolls and air drying thereof is substantially decreased.

3,640,246

DEVELOPMENT APPARATUS FOR LATENT ELECTROSTATIC IMAGES

Lothar S. Jeromin, Sierra Madre, and Hazen L. Hoyt, III, Glendora, both of Calif., assignors to Xerox Corporation, Rochester, N.Y.

Filed Nov. 7, 1969, Ser. No. 874,746
Int. Cl. G03g *13/08*
U.S. Cl. 118—629 **31 Claims**



Powder cloud development apparatus for developing latent electrostatic images including an ion generator adjacent one wall of the development chamber. A cloud of toner particles is introduced into the development chamber through a port in the wall directly opposite the ion generator wall. Above the powder cloud port and the apertures in the ion generator wall, and extending completely between the opposed walls, is a baffle under which the powder and toner clouds meet and are thoroughly mixed. A grid electrode, positioned above the baffle and spaced much further from the photoconductive surface than a conventional powder cloud development electrode, is utilized to control image quality and contrast.

3,640,247

MAGNETIC POWDER APPLICATOR

Frederick Percival Mason, Burgess Hill, and Frank Arthur Oakley Waren, Hove, both of England, assignors to Creed & Company Limited, Hollingbury, Brighton Sussex, England

Filed Mar. 18, 1970, Ser. No. 29,330
Claims priority, application Great Britain, May 29, 1969, 27,166/69
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **6 Claims**

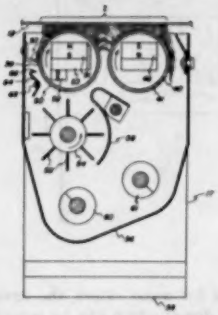
A magnetizable powder applicator arrangement in a printing or display apparatus employing for example a magnetizable drum. The powder is attracted to the outer surface of a nonmagnetizable tube which contains therein a rotatable row of bar magnets having like poles adjacent. The divergent flux field set up by the rotating magnets causes the powder to creep along the surface of the tube in a direction opposite the magnet rotation, and onto a ledge of nonmagnetizable material. The ledge is sufficiently close to the drum, yet sufficiently far from the flux field, for the powder to be attracted to the drum surface without disturbing the selective magnetization thereon.

3,640,248

ELECTROSTATIC MAGNETIC DEVELOPING APPARATUS

William B. Nielander, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed June 4, 1969, Ser. No. 830,285
Int. Cl. B05b *5/00*
U.S. Cl. 118—637 **7 Claims**



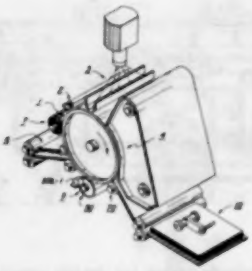
An arrangement of spaced magnetic brushes for developing latent electrostatic images wherein the magnetic fields associated with the brushes overlap so that magnetizable carrier particles are carried from one brush to the other across the space therebetween thereby presenting a continuous magnetic blanket of developing material during development.

3,640,249

TRANSFER APPARATUS

Eugene F. Young, Henrietta, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Oct. 29, 1969, Ser. No. 872,175
Int. Cl. B05b *5/02*; G03g *13/00*
U.S. Cl. 118—637 **7 Claims**



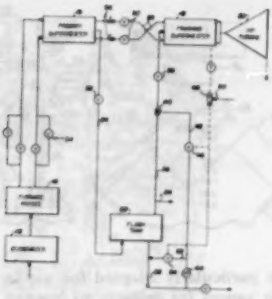
Apparatus for effecting transfer of electroscopic toner particles from a surface carrying electrical charges in image configuration to a support medium. An electrically biased transfer roller having an outer peripheral surface of electrically isolated segments of a conductive resilient material is positioned adjacent the electrical charge carrying surface with the support medium passing therebetween. The electrically isolated conductive segments are selectively actuated in response to the length of the support medium to effect transfer of the electroscopic toner particles thereto to the exclusion of effecting transfer of the toner particles to the transfer roller surface.

3,640,250

STEAM TEMPERATURE CONTROL SPRAY SYSTEM

Raymond M. Costello, Parsippany, and Eugene B. Beckman, Rockaway Township, both of N.J., assignors to Foster Wheeler Corporation, Livingston, N.J.

Filed Mar. 24, 1970, Ser. No. 22,272
Int. Cl. F22b *29/08*
U.S. Cl. 122—406 ST 8 Claims



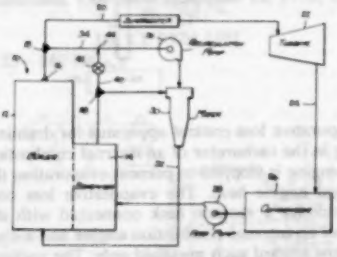
A spray control for adjusting finishing superheater outlet temperature in a once-through generator during startup. The control comprises a low-pressure pump arranged to withdraw liquid from the flash tank of the generator startup bypass and to introduce the liquid into the vapor flow from the flash tank at a point between the flash tank and the finishing superheater. The invention permits exact matching of the enthalpy of the bypass vapor flow entering the superheater with that at the primary superheater outlet at a stage in the turbine loading, when flow is being transferred from the bypass system to the main circuit.

3,640,251

CONTROL OF FLUID FLOW THROUGH CENTRIFUGAL PUMPS

Jeremiah M. Ferguson, Northboro, Mass., assignor to Riley Stoker Corporation, Worcester, Mass.

Filed Aug. 28, 1970, Ser. No. 67,772
Int. Cl. F22b *35/12*
U.S. Cl. 122—406 S 19 Claims



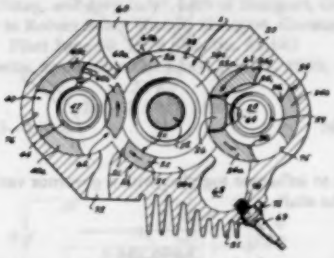
The flow through a steam power plant recirculation circuit is increased and made variable by injection of a certain amount of boiler feed water into the suction side of a centrifugal pump in the recirculation circuit thereby increasing the density of the fluid being pumped and correspondingly increasing the effective pumping pressure in the recirculation circuit.

3,640,252

ROTARY INTERNAL COMBUSTION ENGINE

Raymond G. Spinnett, 1961 A Mitchell, Santa Ana, Calif.

Filed Apr. 13, 1970, Ser. No. 27,539
Int. Cl. F02b *55/08*
U.S. Cl. 123—8.31 17 Claims



A rotary energy converter or engine, for converting fuel combustion into rotary mechanical motion, has a casing providing three annular chambers in which three rotors are mounted for timed rotation. The central rotor has pistons extending axially from one face of a rotor disc, which rotate in the central chamber and which juxtapose at timed periods with abutments on the two noncentral rotors to form momentary function-chambers that permit concurrent phases of intake, compression, power and exhaust functions to occur. The sealing between adjacent function-chambers is accomplished without physical contact of moving parts and especially without the need for minute clearance tolerances and without the need for precision gearing. Recirculation of combusted gases and recirculation of portions of fresh air-exhaust mixtures diminish undesirable emission products. An internal cooling system dissipates heat while another internal venting system entraps leakage gases for further combustion. The form of the juxtaposed pistons and abutments are simplified due to the relative configuration of chambers, pistons and abutments being made to permit circular approximations instead of requiring the perfection of a complex curvature form.

The basic reference for the various relative configurations is the minor radius of the central annular chamber which is made equal to the major radius of the noncentral annular chambers.

3,640,253

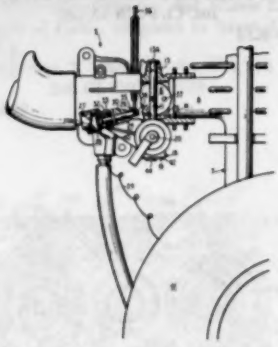
CARBURETOR THROTTLE CONTROL ASSEMBLY

Peter David Glover, Richard Forshaw, and William Henry Steele, all of Milperra, New South Wales, Australia, assignors to Victa Limited, Milperra, New South Wales, Australia

Filed May 1, 1970, Ser. No. 33,583
Claims priority, application Australia, Mar. 31, 1970, 13,181/70
Int. Cl. F02d *31/00*
U.S. Cl. 123—103 B 5 Claims

A single-ended control arrangement for the butterfly spindle in a carburetor, in which a speed governor shaft is geared

to one end of the spindle while the other end is sealed off, and an accelerator element is connected through a spring to



the shaft to influence together with a governor vane the rotation of the shaft.

3,640,254

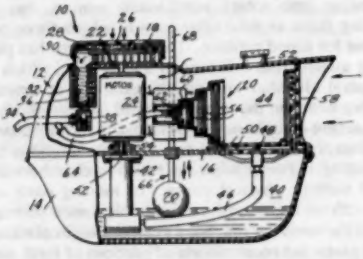
SYSTEM FOR REDUCING AND CONTROLLING EXHAUST EMISSIONS FROM INTERNAL COMBUSTION ENGINES

Frank A. Manfredi, 2026 W. 95th St., Cleveland, Ohio

Filed Feb. 5, 1970, Ser. No. 9,018

Int. Cl. F02m *25/00*

U.S. Cl. 123—119 CF **20 Claims**



A system is described for reducing and controlling certain undesired byproducts from a combustion process in an engine by forcing supplemental air, preferably preheated, into the intake manifold of the engine at a point downstream from a conventional carburetor device. In addition, liquid vapor may be introduced into the intake manifold at approximately the same point. Preferably, a blower means for delivering supplemental air and a pumping means for pumping liquid are both operated by a single variable speed electric motor so that the functions of both devices can be related to changes in engine demands during operation.

3,640,255

CARBURETOR ADJUSTING METHOD

Frederick L. Voelz, Orland Park, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Nov. 4, 1970, Ser. No. 86,930

Int. Cl. F02m *3/00*

U.S. Cl. 123—119 R **10 Claims**

A method for optimizing the performance of an internal combustion engine carburetor to minimize the amounts of carbon monoxide and hydrocarbons in the engine exhaust gases while still providing for an efficiently operating engine is disclosed. The method involves adjusting the air-fuel mixture to the carburetor so as to minimize the amount of hydrocarbons in the engine exhaust gases.

3,640,256

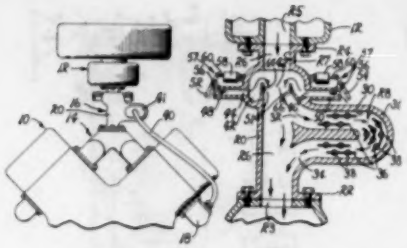
SYSTEM FOR PRECONDITIONING A COMBUSTIBLE VAPOR

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Charles Mangion, Redondo Beach, Calif.

Filed Oct. 21, 1970, Ser. No. 82,647

Int. Cl. F02m *31/14*

U.S. Cl. 123—122 AB **9 Claims**



A system particularly adapted for use in preconditioning combustible vapors for delivery to internal combustion engines, characterized by a system housing including therein a full-flow bore communicating with a bypass conduit and having a vapor heater arranged therewithin, whereby a combustible vapor selectively is mixed and heated to a predetermined temperature as it is delivered in a continuous flow through the system. A particular feature of the invention resides in a provision of an improved control system having a reduced number of moving parts, and including a provision of fluidic bias ports, for imposing directional control on an established flow of vapor and directing predetermined portions of the flow across a heater, whereby the vapor selectively is preconditioned for enhancing subsequent combustion.

3,640,257

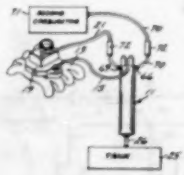
EVAPORATIVE LOSS CONTROL APPARATUS

George W. Cornelius, 279 West 7th St., San Pedro, Calif.

Filed Aug. 25, 1969, Ser. No. 852,854

Int. Cl. F02m *19/00*

U.S. Cl. 123—136 **12 Claims**



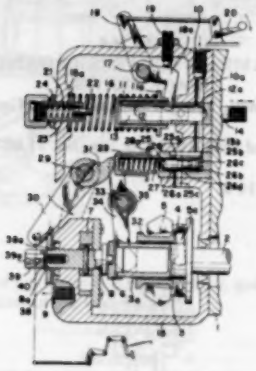
An evaporative loss control apparatus for draining the gas remaining in the carburetor of an internal combustion engine after the engine is stopped to prevent evaporation thereof by the residual engine heat. The evaporative loss control apparatus includes a vacuum tank connected with the intake manifold of an internal combustion engine and a check valve permits flow toward such manifold only. The vacuum tank is connected with the carburetor and a fuel control valve admits flow to such tank when the engine is stopped. The vacuum tank is connected with the automobile gas tank and a dump valve admits flow to the gas tank after the engine is stopped and the carburetor drained. Thus, when the engine is operating the vacuum tank is in communication with the intake manifold to pull a vacuum in such tank. When the engine is stopped the vacuum in such tank is effective to pull the residual gasoline from the carburetor and, when the vacuum tank approaches atmospheric pressure, the gasoline therein will be dumped into the automobile gas tank.

3,640,258

GOVERNOR FOR INTERNAL COMBUSTION ENGINES OF INJECTION TYPE

Hiroshi Isobe; Hachiro Aoki, and Noritoshi Tanaka, all of Saitama, Japan, assignors to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1970, Ser. No. 60,221
Claims priority, application Japan, Aug. 4, 1969, 44/61052
Int. Cl. F02d 1/12
U.S. Cl. 123—140 FG 5 Claims



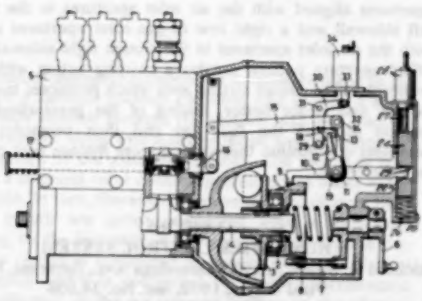
A governor for an internal combustion engine of the injection type. The position of a fuel rod is controlled by the balance of the opposing forces of the spring and a fluid pressure, the latter varying in response to engine speed. The pressure of this fluid is controlled by a control valve operable in one direction to open a bleed port by the force of fluid pressure and thereby increase fuel supply and operable in the opposite direction by the spring force to close the bleed port and thereby decrease fuel supply. Movement of the control valve in the bleed port closing direction is also caused by either a manually operated lever and/or a lever arm, the latter being operated by centrifugal weights in response to engine speed.

3,640,259

REGULATOR FOR GASOLINE INJECTION PUMPS

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Continuation of application Ser. No. 735,332, June 7, 1968, now abandoned. This application June 12, 1970, Ser. No. 48,861
Int. Cl. F02d 1/00
U.S. Cl. 123—140 MC 3 Claims



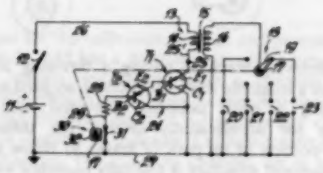
A regulating device for adjusting the rate of flow of a fuel injection pump for an internal combustion engine as a function of the temperature of the engine at its starting includes a cam and lever system responsive, via a thermostatic element, to the temperature of the engine at the instant of its starting. The device can be adjusted to inject the supplementary amount of fuel necessary for starting the engine properly when the engine is still cold, while the amount of injected fuel can be decreased when the engine to be started, or restarted, is already warm or in the neighborhood of its optimum working temperature.

3,640,260

IGNITION ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES

Hermann Mittag, and Jorg Issler, both of Stuttgart, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed June 30, 1970, Ser. No. 51,181
Claims priority, application Germany, July 12, 1969, P 19 35 517.0
Int. Cl. F02p 3/06
U.S. Cl. 123—148 E 10 Claims



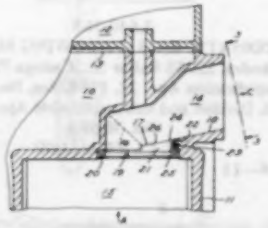
The ignition arrangement, which, as an integrated circuit, is fixed to the distributor housing, comprises a battery-powered circuit having two transistors Darlington connected, of which the common load is the primary winding of a spark coil or of an ignition capacitor charging transformer. A cam on the distributor shaft periodically opens a make-and-break switch in the circuit.

3,640,261

INTERNAL COMBUSTION ENGINES

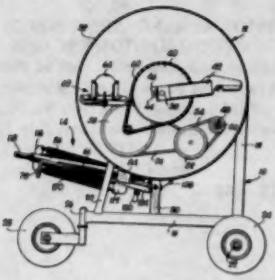
Geoffrey Ernest Josey, 35 Norfolk Close, Maldon, England

Filed May 25, 1970, Ser. No. 40,011
Claims priority, application Great Britain, Aug. 7, 1969, 39,606/69
Int. Cl. F01l 3/22, 3/06
U.S. Cl. 123—188 S 6 Claims



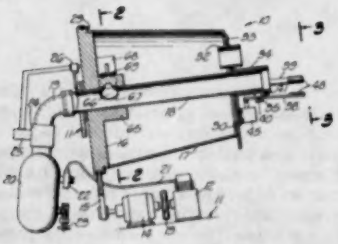
An internal combustion engine including a cylinder head having a passage positioned therein adapted to communicate with a combustion chamber and adapted to carry either a fuel-air mixture or products of combustion. The passage has first and second portions positioned at an angle to one another that are formed by a pair of retractable dies during a casting process thereby leaving a sharp discontinuity. A valve seat insert is positioned in one portion of the passage and it includes a lip having an inner surface which curves or tapers smoothly toward this discontinuity to improve the gaseous flow characteristics of the passage.

3,640,262
TRAJECTORY CONTROL MECHANISM FOR BALL PITCHING MACHINE
Paul Robert Hunsicker, Kansas City, Kans., assignor to Commercial Mechanisms, Inc., Kansas City, Mo.
Filed Aug. 17, 1970, Ser. No. 64,315
Int. Cl. F41b *3/04*
U.S. Cl. 124—7 **10 Claims**



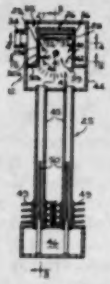
A ball-throwing machine having a throwing arm rigidly mounted on a rotatable shaft and a crank secured to the shaft for effecting a drive coupling provided with a force mechanism for acceleratedly driving the throwing arm through a portion of its path of travel to throw a ball. An elongated support structure is pivotally mounted with respect to the frame of the machine and supports the force mechanism for movement longitudinally of the structure. In this manner the line of force of tension spring means which comprises the mechanism is varied relative to the path of travel of the throwing arm. Thus, the point of application of the accelerative driving force, which is applied to the throwing arm as the latter reaches an overcenter position in its path of travel, is varied to alter the trajectory of a ball being thrown. A mounting component of the force mechanism has a locking element in the form of spring-biased detent means which is interengageable with a corresponding locking element in the form of a plurality of slots in the support structure. These cooperating elements are selectively interengageable to lock the spring means relative to the supporting frame of the machine. Springs bias the interengageable elements into their normal locking positions and a camming surface of the support structure is movable against the action of one of the springs to disengage the locking elements and permit swinging of the spring means longitudinally of the structure.

3,640,263
AUTOMATIC BALL-THROWING MACHINE
Barry V. Rhodes, 22358 Baltar St., Canoga Park, Calif.
Original application Apr. 22, 1968, Ser. No. 723,149, now abandoned. Divided and this application Apr. 22, 1970, Ser. No. 30,903
Int. Cl. F41b *11/00*
U.S. Cl. 124—11 **5 Claims**



A ball-throwing apparatus for throwing balls utilizing pressurized air and a fast-action valve. The barrel and breech are enclosed by a rotating cage containing a supply of the balls wherein a single ball is selected from the tumbling supply of balls by an L-shape leg member attached to the cage and leading to an opening in the barrel. The device includes randomly varied ball trajectory structure which is in the form of an adjustable bleeder valve venting air, to the atmosphere at different rates to vary the pressure which is discharging the ball and, or, movable fingers which randomly project into the path of a discharged ball to carom the ball into a different path. The varied trajectory structure can be manually controlled or prearranged by timer-driven cam discs.

3,640,264
COMBUSTOR MEANS FOR PRESSURIZED GAS-FIRED SPACE HEATER
Richard C. Barnett, Tyler, Tex., assignor to General Electric Company
Filed Sept. 10, 1970, Ser. No. 71,007
Int. Cl. F24h *3/08*
U.S. Cl. 126—110 R **10 Claims**

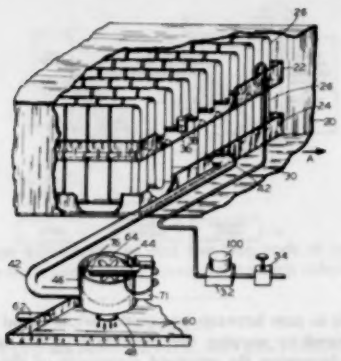


This invention provides improved combustor means for mixing and burning fuel gas and pressurized air to produce a highly intense heat source for a gas-fired space heater. The combustor means comprises a generally horizontal elongate trough having generally vertical left and right long sidewalls that are pierced by a plurality of combustion air inlet apertures and a fuel gas supply conduit which extends longitudinally through the trough. The gas conduit has a surface that is pierced by a plurality of fuel gas inlet apertures which are arranged such that the gas enters the trough generally parallel to its two apertured sidewalls, and is turbulently mixed with pressurized combustion air in a fuel gas-air mixing area that is defined by the two apertured trough sidewalls and the apertured gas conduit surface. The percent invention provides the apertured surface of the gas conduit with at least two offset rows of apertures including a left row of gas inlet apertures aligned with the air inlet apertures in the trough left sidewall and a right row of gas inlet apertures aligned with the air inlet apertures in the trough right sidewall. This offset aperture pattern creates a swirling action within the combustor fuel gas-air mixing area which promotes more turbulent, and hence better, mixing of the pressurized combustion air and the fuel gas and thus promotes more complete combustion thereof and more intense heat production therefrom.

3,640,265
HUMIDIFIER CONTROL SYSTEM
Richard H. Swart, Sr., 817 Onondaga Ave., Syracuse, N.Y.
Filed May 4, 1970, Ser. No. 34,038
Int. Cl. F24f *3/14*
U.S. Cl. 126—113 **11 Claims**

Humidifier for hot air heating systems having a water-evaporating pan with an overflow, means to supply water to

said pan, at a rate exceeding the rate of evaporation, a removable partially submerged fin, a float chamber receiving



the overflow and having an adjustable bleed, and a float actuated switch to control the water supply.

3,640,266

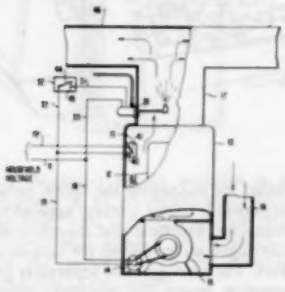
AIR-HUMIDIFYING SYSTEM AND COMPACT SPRAY HUMIDIFIER FOR THE SAME

Dale S. Ernest, Beltsville, Md., assignor to Jesse I. Broughton and John G. Hannon, Md.

Filed July 1, 1970, Ser. No. 51,585

Int. Cl. F24f *3/14*

U.S. Cl. 126—113 **4 Claims**



A humidifier assembly comprises a housing coupled to the exterior of a furnace plenum chamber and carries a spray nozzle which extends through the plenum wall and into the plenum chamber along with a thermostatic switch responsive to temperature in the plenum chamber. The switch is connected to a solenoid valve controlling delivery of water to the spray nozzle. In turn, the solenoid valve and the plenum thermostatic switch are series connected with a humidistat responding to the humidity in the space served by the furnace. This circuit is connected in parallel with the furnace blower motor which is controlled by another thermostatic switch positioned in the air passage leading to the plenum chamber. The blower control switch closes at a temperature above, and opens at a temperature below, the temperatures which close and open the thermostatic switch of the compact humidifier assembly.

3,640,267

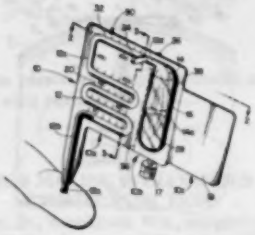
CLINICAL SAMPLE CONTAINER

Carl R. Hurtig, Scituate; Andres Ferrari, and Amin J. Khoury, both of Dover, all of Mass., assignors to Damon Corporation, Needham Heights, Mass.

Filed Dec. 15, 1969, Ser. No. 884,924

Int. Cl. A61m *1/00*

U.S. Cl. 128—2 **11 Claims**



A container for the collection, storage and processing of a sample of body fluid has a graduated receiving tube for collecting the sample and which feeds a chamber that is resiliently collapsible to aspirate the sample into the tube and thence into the chamber. Initially, a frangible seal closes the tube-chamber junction to maintain a sample-treating reagent within the chamber. The tube and chamber are in a unitary, self-supporting structure which also has a panel or the like for carrying indicia identifying the sample.

3,640,268

METHOD AND DEVICE FOR BIOPSY SPECIMEN COLLECTING AND HANDLING

Hugh J. Davis, 507 North Castle, Baltimore, Md.

Filed Oct. 23, 1965, Ser. No. 503,679

Int. Cl. A61b *10/00*

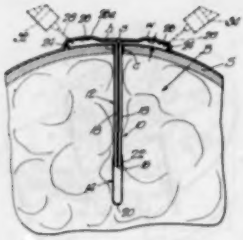
U.S. Cl. 128—2 B **16 Claims**

A method for procuring and processing samples of cellular material which comprises the steps of removing from a body cavity samples of cellular material, washing the samples of cellular material into a fluid container and processing the samples of cellular material directly within the container structure for eventual analysis in the cancer detection; the apparatus for use in carrying out the method includes a tubular member, a cap adapted to fit over one end of the tubular member to close the same, a fluid container adapted to be used as centrifuging container adapted to be connected to the other end and a swab structure or the like adapted to be removably connected with the other end of the tubular member. The dimension of the cap and other end are thereby so chosen that the cap can also be connected to the other end of the tubular member so as to form a pipette structure.

3,640,269
FLUID-CONDUCTING INSTRUMENT INSERTABLE IN LIVING ORGANISMS

Jose M. R. Delgado, 50 Autumn St., New Haven, Conn.

Filed Oct. 24, 1969, Ser. No. 869,170
Int. Cl. A61b 5/00
U.S. Cl. 128—2 R 5 Claims

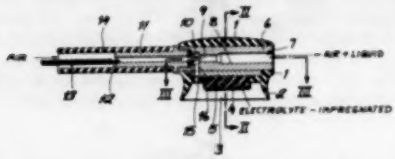


An instrument for insertion in living organisms, having two flexible fluid-impermeable tubes open at one end and provided at the other end with enlarged bag formations which are self-sealing after being punctured with a needle, and a porous bag closed except for an open end with which the open tube ends communicate, with the latter being received in and attached to the open bag end and sealed from the outside of the bag.

3,640,270
ELECTRIC CONTACTOR WITH VENTURI-SUCTION MEANS FOR ORGANIC TISSUE

Heiner Hoffmann, Herrlingen, Germany, assignor to Ingeborg Niess, Elektromedizinische, Herrlingen, Germany

Filed July 29, 1970, Ser. No. 59,283
Claims priority, application Germany, Aug. 2, 1969, P 19 39 523.4
Int. Cl. A61b 5/04
U.S. Cl. 128—2.1 E 7 Claims



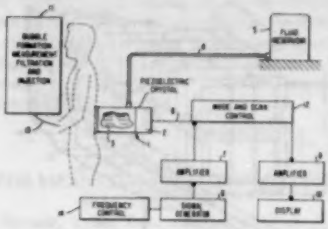
A contactor for diagnostic or therapeutic use on human or animal tissue comprises a suction cup of elastomeric material containing an electrolyte-impregnated sponge near the mouth of the cup supported on an electrode plate from which a conductor extends insulatedly outwardly inside a tube leading to a source of air under pressure. This tube, traversing the cup inwardly of the electrode plate, forms a Venturi nozzle for aspirating air from the interior of the cup and terminates in an outlet which opens into the atmosphere for dispersing entrained liquid.

3,640,271
BLOOD FLOW PRESSURE MEASUREMENT TECHNIQUE EMPLOYING INJECTED BUBBLED AND ULTRASONIC FREQUENCY SCANNING

John W. Horton, Houston, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1969, Ser. No. 837,737
Int. Cl. A61b 5/02
U.S. Cl. 128—2.05 D 7 Claims

A nonsurgical technique of measuring blood characteristics of pressure and flow by injecting minute gas bubbles into the bloodstream. The bubbles are subjected to a beam of ultrasonic radiation and flow is determined by detecting the resultant scattering which is indicative of the time taken for

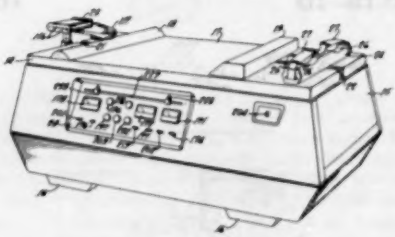


the bubble to pass between two points, while blood pressure is determined by varying the frequency of the ultrasonic beam to determine the resonant frequency of the bubbles which is proportional to pressure.

3,640,272
THERAPY TABLE

Joseph L. Hussey, Costa Mesa, Calif., assignor to Pete J. Bonin, Newport Beach, Calif.

Filed July 24, 1969, Ser. No. 844,581
Int. Cl. A61b 11/00
U.S. Cl. 128—33 41 Claims



A therapy table for massaging the spinal column of a patient while the person is under traction applied to the cranial and pedal extremities. Identical and therefore interchangeable movable carriages are provided for connection to those body extremities. The carriages are separately provided with identical locomotion means for positively moving them to and fro longitudinally of the table, supplemented by means for controlling and limiting and cyclically varying the traction forces applied. Intermediate its ends the table is provided with still another carriage having locomotion means for moving it to and fro longitudinally of the table. This carriage has a vibratory support for rollers that may be brought with variable pressure against the back of a patient lying supine on the table, for massaging the spinal area.

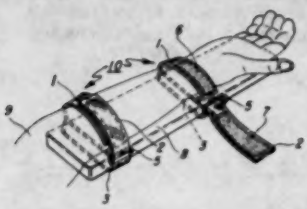
3,640,273
STRAP ASSEMBLY FOR SECURING A PATIENT'S ARM TO AN ARM BOARD

Tommy D. Ray, 2218 Edison Drive, San Antonio, Tex.

Filed Mar. 13, 1970, Ser. No. 19,153
Int. Cl. A61f 5/04
U.S. Cl. 128—87 7 Claims

A strap assembly having three strap sections extending from a near common center. One strap section has a slip ring attached to its free end, allowing the free end of a second

strap section to be passed through the slip ring. The free end of either or both of the second and third strap sections has a



connection attachment so that the free ends of both strap sections can be temporarily connected to each other.

3,640,274

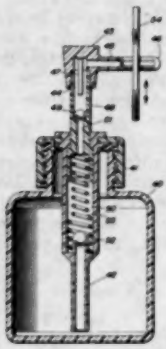
EYE-SPRAYING DEVICE HAVING MIRROR

Christopher Hollet Costello, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Original application Nov. 4, 1966, Ser. No. 592,025, now Patent No. 3,506,001. Divided and this application Sept. 3, 1969, Ser. No. 868,262

Int. Cl. A61m *11/00*

U.S. Cl. 128—173 5 Claims



The device disclosed herein includes a container for medicated solutions to be administered to the eye, an outlet member associated with the upper portion of the container serving as a directional sprayer, and a mirror mounted and positioned on the device so that the image of the eye is reflected to the user of the device.

3,640,275

INTRAVENOUS NEEDLE ASSEMBLY

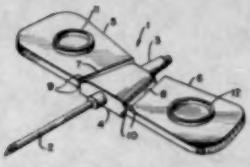
George K. Burke, and Kenneth Raines, both of Bethlehem, Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.

Filed May 5, 1970, Ser. No. 34,800

Int. Cl. A61m *5/32, 5/00*

U.S. Cl. 128—214 13 Claims

An intravenous needle assembly for administering medication into a patient comprising a cannula having a hub portion from the opposite sides of which extend a pair of hub wing sections. The hub wing sections are adapted to flex in either direction around said hub into abutting contact with one another to form a gripping handle for holding the cannula while it is being inserted into the vein of the patient. The wing portions include interlocking means thereon which serve both to lock the wing portions together in an upright position thereby preventing them from slipping relatively to one another and also to provide a roughened surface on the outside of said wing portions thereby lessening the danger of



the fingers of the person handling said needle assembly from slipping on said wing portions.

3,640,276

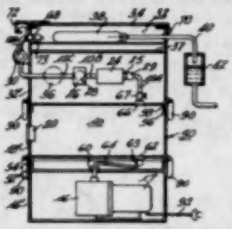
APPARATUS FOR MAKING INTRAVENOUS OR INTRA-ARTERIAL INJECTIONS

Robert C. Dancy, Jr., Brookfield, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Jan. 9, 1970, Ser. No. 1,745

Int. Cl. A61m *05/00*

U.S. Cl. 128—214 F 2 Claims



An apparatus for and method of making intravenous or intra-arterial injections such as forced blood transfusions or the like. In a preferred embodiment of the apparatus a modular construction is provided including a first housing unit for the air pressure chamber which receives the flexible blood container or the like and subjects it to a predetermined controlled air pressure. The modular assembly may include a second housing unit for a plenum chamber in fluid communication with the pressure chamber through an air pressure regulator. A third housing unit may be provided to receive an air compressor for supplying the plenum chamber with air. The plenum chamber may also be charged either from the hospital air supply or by the compressor with sufficient air for a predetermined number of blood transfusions and used in conjunction with the air pressure regulator and pressure chamber as a portable subassembly. In another modification, the pressure chamber or a pressure cuff may be connected directly to the hospital air supply through the air pressure regulator without using a plenum chamber in the system.

3,640,277

MEDICAL LIQUID ADMINISTRATION DEVICE

Marvin Adelberg, 4043 Cody Road, Sherman Oaks, Calif.

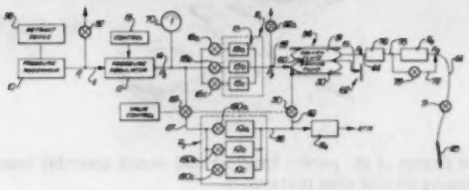
Filed Dec. 9, 1968, Ser. No. 782,399

Int. Cl. A61m *05/00*

U.S. Cl. 128—214 F 28 Claims

Positive pressure apparatus for providing an adjustable and reliably constant delivery rate of medical liquids from parenteral applicators, including a self-contained portable medical liquid administration device wherein precisely regulated gas flow through a first flow restrictor operates to pressurize and cause to flow at a substantially constant rate a

liquid from a supply through a second flow restrictor which has a flow/pressure drop characteristic such that the liquid



flow is essentially independent of gravity-induced pressure fluctuations.

3,640,278

HYPODERMIC SYRINGE DEVICE WHICH MAINTAINS STERILE CONDITION OF NEEDLE

Benjamin Friedman, 1064 Victory Blvd., Staten Island, N.Y.

Filed Oct. 13, 1969, Ser. No. 865,818

Int. Cl. A61m *05/24, 05/26*

U.S. Cl. 128—218 D **5 Claims**

This invention is directed to a hypodermic syringe including a longitudinally windowed barrel having a pair of apertured ends, one of which is adapted to retain a normally fixed, but removable, needle assembly having its inner end projecting toward the other end, and the other of which is adapted to retain a reciprocable actuating rod having one end operatively connectable to the plunger of a dispensing or collecting cartridge removably retained within the barrel. Cartridges may be inserted or replaced at will through a window of the barrel without necessitating the removal of or causing contamination of the needle assembly. Releasable members are provided to secure the cartridge in its needle and actuating rod-engaging position within the barrel. Threaded members are employed for mounting the actuating rod, which members also assist in so securing the cartridge.

3,640,279

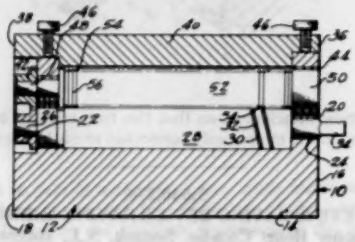
SKIN GRAFT CUTTING METHOD AND MACHINE

Warren F. Brown, deceased, Atlanta, Ga.; Margery Joy Brown, and The First National Bank of Atlanta (Executors of the estate of said Warren F. Brown, deceased)

Filed Dec. 7, 1967, Ser. No. 688,866

Int. Cl. A61b *17/322*

U.S. Cl. 128—305 **10 Claims**



Preparing a skin graft by removing a section of skin, splitting it along a plurality of equally spaced, closely associated lines, and interrupting each cut at intervals, then stretching the skin forming openings each bounded by four sides in a netlike, substantially flat graft. A machine for preparing a skin graft comprising a first roller of metal or the like having a plurality of equally spaced, cutting edges extending along the length of the roller and each being a circular, thin cutting edge having the plane thereof perpendicular to the centerline of the roller; and the second, plastic roller having grooves formed uniformly therein in spaced relation along the length thereof and the plane of the bottom of the groove being at an angle to the centerline of the roller at an angle to the cutting edge of the other roller so that when a skin graft is passed therebetween the skin is cut in a series of closely spaced, uniformly slit lines having solid portions at intervals where the cutting edge drops into the groove in the roller, thereby preparing the skin graft to be stretched in a netlike formation.

3,640,280

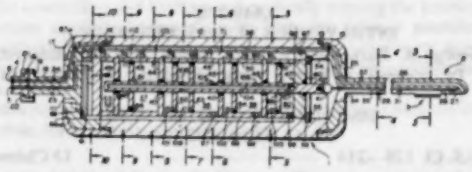
POWER-DRIVEN RECIPROCATING BONE SURGERY INSTRUMENT

Daniel R. Slanker, 2639 S. 90th East, Tulsa, Okla., and Edwin E. Slanker, Route 1, Box 541A, Bartlesville, Okla.

Filed Nov. 26, 1969, Ser. No. 880,094

Int. Cl. A61b *17/14;* **B23d** *49/16*

U.S. Cl. 128—317 **9 Claims**



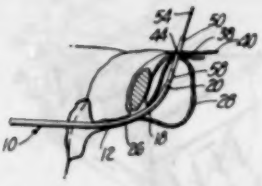
A bone surgery tool is provided with a reciprocating drive means. The tool and a flexible drive band can be enclosed in a shroud to protect tissue against contact with the tool or the driving means. The shroud can also contain a channel for a flushing fluid. The power unit can utilize a double-acting fluid piston, with the reversal in the direction of movement of the piston being effected by a fluidic control device.

3,640,281

METHOD OF INSERTING A SUPRAPUBIC CATHETER

Jack R. Robertson, 1451 Refugio Road, Santa Ynez, Calif.

Filed Jan. 2, 1970, Ser. No. 297
Int. Cl. A61b *17/34*
U.S. Cl. 128—347 **5 Claims**



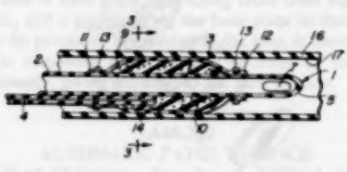
A method of and an instrument for inserting a suprapubic catheter. The instrument comprises a tube having a curved distal portion insertable through the urethra into the bladder to bring the distal end of the tube in engagement with the wall of the bladder in register with the suprapubic area of the abdominal wall. After inflating the bladder with a suitable fluid through the tube and a lateral opening in the curved distal portion thereof, an incision is made through the abdominal wall and the wall of the bladder in register with the distal end of the instrument, which then emerges outwardly through the incision.

3,640,282

TRACHEAL TUBE WITH NORMALLY EXPANDED BALLOON CUFF

Jack M. Kamen, 440 Tippecanoe Pl., Gary, Ind., and Carolyn J. Wilkinson, Chicago, Ill., assignors to said Kamen, by said Wilkinson

Filed Aug. 6, 1970, Ser. No. 61,586
Int. Cl. A61m *25/00*
U.S. Cl. 128—351 **10 Claims**



A tracheal tube for use in intubation of a trachea, and embodying a resilient, yieldable cuff for effecting an air seal between the tube and the trachea. The cuff contains a resilient member, such as a rubber sponge, which resiliently maintains the cuff in an expanded position away from the tube. The cuff may be contracted by means of a vacuum applied thereinto by a secondary tube mounted on the tracheal tube. The cuff in its normal expanded position within the trachea affords a good seal and at the same time prevents injury to the tracheal wall by virtue of its yieldable contact therewith.

3,640,283

DISPOSABLE BLOOD-WARMING CONTAINER

Surindar Kumar Bhatia, Evanston, and Charles Rogers Memhardt, Morton Grove, both of Ill., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Mar. 2, 1970, Ser. No. 15,704
Int. Cl. A61f *07/00*
U.S. Cl. 128—399 **5 Claims**

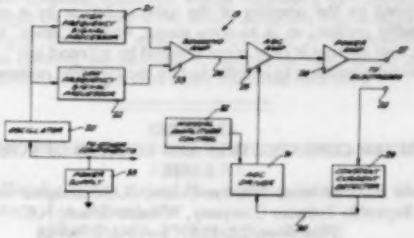
A container for adjusting the temperature of liquids such as blood flowing therethrough, which comprises a plastic envelope, heat sealed to define a tortuous fluid flow conduit therein. The conduit has an inlet and an outlet communicating with the exterior of the container. The outlet communicates with the interior of a drip chamber, the end of the outlet being spaced from the walls of the drip chamber to permit liquid passing from the outlet to fall a short distance through space, to indicate the rate of liquid flow, and to separate and entrap in the drip chamber any gas bubbles present.

3,640,284

APPARATUS FOR ELECTROTHERAPY OF THE PUBOCOCCYGEUS

Philip A. De Langis, 3616 Palos Verdes Drive North, Palos Verdes Estates, Calif.

Filed Jan. 5, 1970, Ser. No. 762
Int. Cl. A61n *01/06*
U.S. Cl. 128—422 **4 Claims**



Apparatus for electrotherapy of the pubococcygeus muscle group of a female. The apparatus includes an electrode member contoured for insertion into the vagina. Spaced electrodes on the member are supplied with a carrier signal comprising shaped, bipolar pulses in the frequency range of from 20 Hz. to 8 kHz., the signal being carrier modulated at a rate of between 0.2 Hz. and 10 Hz. The bipolar pulses exercise striated muscle, while the low-frequency modulation contracts smooth muscle and prevents continuous tetany. A condom-type vaginometer permits measurement of vaginal volume and of vaginal pressure resulting from contraction of pubococcygeus muscles.

3,640,285

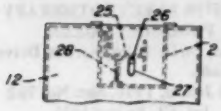
CIGARETTE PAPER AND METHOD FOR PREPARATION

Theodore Briskin, and Geoffrey R. Ward, both of Beverly Hills, Calif., assignors to Sutton Research Corporation, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 745,372, July 17, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 595,622, Nov. 21, 1966, now Patent No. 3,447,539, and a continuation-in-part of 674,994, Oct. 12, 1967, now abandoned. This application Dec. 17, 1968, Ser. No. 784,472
Int. Cl. A24b *15/00*; **A24f** *3/00*; **D21f** *11/00*
U.S. Cl. 131—2 **24 Claims**

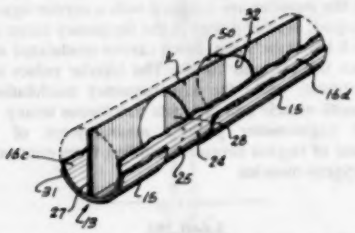
Cigarette paper having improved taste and aroma during pyrolysis wherein the paper is loaded with an agent comprising up to 45 percent by weight calcium oxalate preferably formed in situ internally in the paper fibers and/or conversion of the cellulosic fibers by selective oxidation to convert preferably 40 to 60 percent of the methylol groups on the C_6 position to carboxylic acid groups and further treatments.

3,640,286
ASHTRAY WITH USE INDICATOR
Gregory L. Wellnitz, Waterbury, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed July 15, 1970, Ser. No. 55,027
Int. Cl. A24f 15/08
U.S. Cl. 131—235 9 Claims



An ashtray with interconnected indicator means for showing use thereof. The indicator means is particularly useful for ashtrays that are mounted in aircraft seat armrests or in other public conveyances such that only those showing usage need be cleaned by maintenance personnel. The indicator means is tripped by the opening of the ashtray lid, or by a movable snuffer section, so as to show usage, while a "reset" to show a clean ashtray is only accomplished by a "reset key" or by a special operation to be effected by the cleaning personnel.

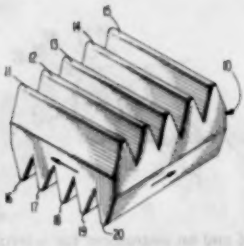
3,640,287
FILTER CONSTRUCTION AND METHOD OF FORMING SAME
Jesse R. Pinkham, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Sept. 22, 1969, Ser. No. 859,968
Int. Cl. A24d 01/04; A24f 07/04, 13/06
U.S. Cl. 131—261 B 9 Claims



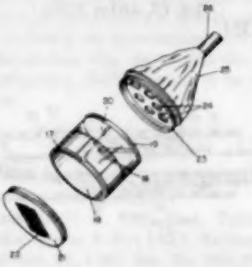
A filter is provided for attachment to the downstream end of a tobacco rod. The filter includes a unitary core piece formed from a single blank of sheet material and a sleeve unit encompassing said core piece and cooperating therewith to form a shallow passageway through which smoke is caused to flow subsequent to having impinged at a high velocity against a surface forming the passageway.

3,640,288
COLOR APPLICATOR FOR HAIR
Abram N. Spanel, 344 Stockton St., Princeton, N.J.
Filed July 29, 1970, Ser. No. 59,098
Int. Cl. A45d 24/24
U.S. Cl. 132—9 12 Claims

In contrast with combs carrying coloring material in wet or dry form, there is utilized a block of wax in which the coloring matter is carried with the block having outwardly extending elongated and/or curved surfaces, some spaced one from the other for applying the wax and coloring matter to the hair with minimum deposit of either on the scalp.

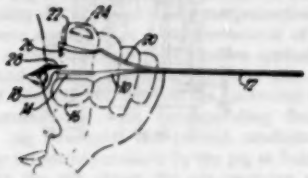


3,640,289
HAIR THREADER
Ralph A. Sbarra, 347 Graham Ave., Brooklyn, N.Y.
Filed Sept. 1, 1970, Ser. No. 68,743
Int. Cl. A45d 1/00
U.S. Cl. 132—9 2 Claims



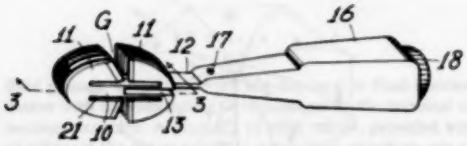
This invention consists of a clear plastic cylinder having one or more peripheral and external threads on each end thereof on which is screwed especially designed flat caps. The cap that is screwed onto the upper end of the aforesaid cylinder is provided with a plurality of round openings, and the same cap is encompassed by a flexible cone-shaped cover that has its apex terminating in encompassing the lower end of a vent tube. The cap that is screwed onto the lower end of the aforesaid cylinder is provided with a rectangular opening that is covered with a plurality of fibers that are cemented to the underside of the cap. A rectangular hair-threading member that is adapted to be placed through the rectangular opening in the aforesaid cap is a part of this invention and is used in the manner fully understood by those experienced in the art of hair styling. Another removable cap is part of this invention. The just-mentioned cap has a flattened tube that is elliptical when viewed from the end, the tube extending outward from the center thereof, the aforesaid tube having its outer end terminate in a peripheral flange that has a tip extending outward therefrom for a purpose known to hair stylists and the like.

3,640,290
APPARATUS FOR CURLING EYE LASHES
Kathlene Theis, Route 1, Blue Ridge, Tex.
Filed Aug. 28, 1970, Ser. No. 67,800
Int. Cl. A45d 2/42
U.S. Cl. 132—32 C 3 Claims



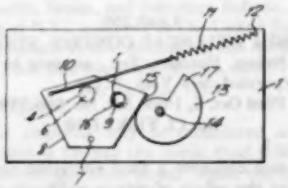
A first plate is supported by the thumb of a user. A second plate is supported by the index finger of the user. Eyelashes are held between the plates and when relative sliding motion is applied between the plates in a direction parallel to the lashes, a curling action ensues.

3,640,291
TOOTH-CLEANING TOOL
Miyoji Mizuno, 757, Tatsumicho, Hichijyo-agaru, Shinmachi-doori Shimogyoku, Kyotoshi, Japan
Filed Jan. 30, 1970, Ser. No. 7,011
Int. Cl. A45d 44/18
U.S. Cl. 132—84 5 Claims



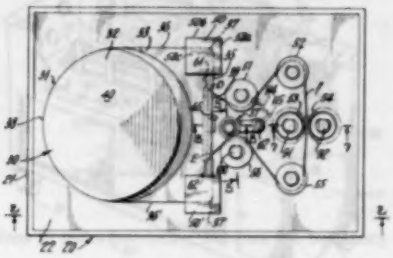
A tooth-cleaning tool having finlike plates formed integrally with a base plate, extending from both sides of the base plate, and a grip pivoting the base plate so that the base plate can be pivotable in relation to the grip, is found very effective in removing food remains sticking to teeth, and, simultaneously, giving massage to the gum portion.

3,640,292
AUTOMATIC PAYOUT DEVICE
Edward Hugh Clairmonte, New Barnet, England, assignor to Clairmonte Bros., Limited, London, England
Filed Dec. 30, 1969, Ser. No. 889,068
Claims priority, application Great Britain, Jan. 1, 1969, 153/69
Int. Cl. G07d 1/00
U.S. Cl. 133—5 6 Claims



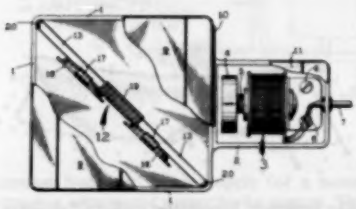
The invention relates to an automatic device for paying out a bonus on an automatic vending or coin-operated washing machine, the device comprising an intermittently operated ejector plate which transfers the bonus from a reservoir to an ejector chute.

3,640,293
METHOD AND APPARATUS FOR CLEANING FILM
Myron L. Freedman, c/o Comprehensive Service Corporation, 250 West 64th St., New York, N.Y.
Filed Feb. 18, 1969, Ser. No. 800,116
Int. Cl. B08b 1/02, 7/04
U.S. Cl. 134—9 11 Claims



A method and apparatus for cleaning films of the continuous strip type housed in cartridges. Rotary brushes of a portable cleaning apparatus which receives a film cartridge are turned by the same drive which advances film withdrawn in a loop from the cartridge. Cleaning is accomplished without opening the cartridge to remove the film, so any user of such film cartridges may easily clean his own films.

3,640,294
ELECTRIC SONIC DEVICE FOR CLEANING SMALL ARTICLES
Jerry Piccolo, Miami Lakes, Fla., assignor to Advance Metal Products, Inc., Miami, Fla.
Filed Oct. 20, 1969, Ser. No. 867,803
Int. Cl. B08b 3/04, 11/02
U.S. Cl. 134—117 3 Claims

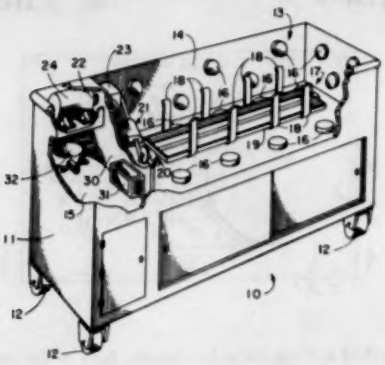


A rigid container for holding a cleaning liquid including a removable holder for suspending articles to be cleaned in the liquid and an electromagnetic device secured to said container for oscillating the container and liquid therein at sonic frequencies when energized for rapidly cleaning the aforesaid articles.

3,640,295
ULTRASONIC CLEANER AND SURGICAL INSTRUMENT CASE
Wendell C. Peterson, 7107 Prospect Pl., N.E., Albuquerque, N. Mex.
Filed Apr. 21, 1970, Ser. No. 30,458
Int. Cl. B08b 7/02
U.S. Cl. 134—159 1 Claim

An ultrasonic cleaner and surgical instrument carrying case, which is usable separately and apart from or in combination with the ultrasonic cleaner, the ultrasonic cleaner including within at least one sink an oscillatable cradle which may carry the instrument case during the ultrasonic cleaning

process. Additionally provided as a part of the ultrasonic cleaner are a pump and filter to circulate a cleaning fluid within the sink of the ultrasonic cleaner and to remove particles and other matter from the fluid. The instrument case includes, within a chamber walled with expanded metal or



other perforated material, means for retaining the contained instruments at desired locations, which may include a plurality of posts adapted to receive various instruments and a plurality of retaining members attachable to the posts to lock the instruments in position.

3,640,296

PAVILION WITH MECHANISM FOR AUTOMATICALLY CONTROLLING SAG AND TENSION

Carl F. Huddle, Pleasant Ridge, Mich., assignor to Tension Structures Co.

Filed Aug. 28, 1970, Ser. No. 67,712
Int. Cl. E04b *1/347*
U.S. Cl. 135—4 R **9 Claims**

A tentlike structure, hereinafter called a "pavilion," which includes two arches inclined away from each other at acute angles to the vertical and mounted so that they may be swung about their leg ends toward and away from this position and moved bodily toward and away from each other, a membrance of which one end is attached to each of the arches, and means for automatically sensing departures of the tension and/or the sag in the membrane from the desired values and moving the arches to correct them.

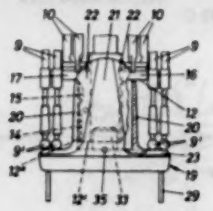
3,640,297

LONGITUDINALLY COLLAPSIBLE FLAT UMBRELLA

Fritz Bremshey, Solingen-Ohligs, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada

Filed May 19, 1969, Ser. No. 825,824
Claims priority, application Germany, May 24, 1968, P 17 57 603.3
Int. Cl. A45b *19/06, 11/00*
U.S. Cl. 135—25 **1 Claim**

A telescopically collapsible umbrella producing a generally flat, rectangular package when collapsed, in which a crownpiece, runners and handle generally define the collapsed rectangular shape, and in which an improved handle and runner include cooperating recesses and orienting portions positively insuring orientation of the umbrella runner



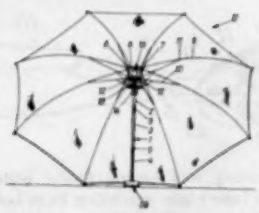
carrying stretcher ribs and camming portions orienting dome rib tips to insure proper operation of the umbrella during erection and collapse.

3,640,298

AUTOMATICALLY OPENED, LONGITUDINALLY COLLAPSIBLE UMBRELLA WITH IMPROVED HANDLE

Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, East Montreal, Quebec, Canada

Filed Mar. 2, 1970, Ser. No. 15,728
Claims priority, application Germany, Mar. 12, 1969, P 19 12 437.9
Int. Cl. A45b *19/08*
U.S. Cl. 135—25 **7 Claims**



A longitudinally collapsible umbrella having a rectangular configuration when closed, collapsed and stored; including a power spring interposed axially between primary and auxiliary slides; the primary slide including a depending sleeve and having a T-shape in elevation; the primary slide including beneath its wings a pair of finger-receiving notches, one of the notches including a pivotal latch lever; the sleeve having a polyangular, lower cross section generally defining the points of an elipse, and the handle of the umbrella having lateral compartments for receiving the tips of umbrella dome-ribs when the umbrella is collapsed, and the handle also including a tubular tunnel having a bore correspondingly receiving the primary slide sleeve and orienting the primary slide wings and dome-rib tips in an optimum position.

3,640,299

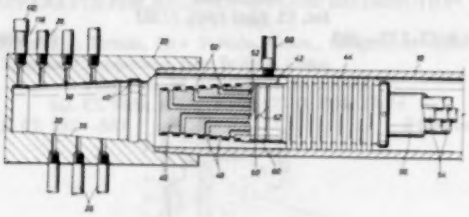
SUBSEA WELLHEAD CONTROL SYSTEM

Norman A. Nelson, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 6, 1969, Ser. No. 866,789
Int. Cl. F16k *11/10*
U.S. Cl. 137—1 **13 Claims**

The invention concerns a fluid energized control system for controlling the valves of subsea wellheads and for controlling other like mechanical devices designed for fluid actuation. A single protective conduit is connected at one extremity thereof to a control facility while its other extremity terminates in connection structure located adjacent or attached to a remotely located wellhead or other mechanical

device. Suitable actuator control conduits extend from a plurality of fluid-controlled wellhead valve actuators and are connected in fluid communication to the connection structure. The terminal connection structure is provided with internal fluid passages communicating with respective ones of the actuator conduits and defines a pig-receiving recess. A locomotive pig is inserted into the protective conduit at the control facility and is moved within the protective conduit by fluid pressure applied from a suitable source of pressurized fluid or by a combination of fluid pressure applied at one side of the pig and a suction applied to the other side of the pig. A plurality of valve control conduits are connected to the pig in fluid communication with corresponding fluid passages formed in pig structure. The control conduits are pulled through the protective conduits by the pig as fluid pressure is applied. As the pig enters the pig-receiving recess, it is oriented, if necessary, by appropriate orienting structure and is locked into assembly within the recess with appropriate



fluid passage structure of the pig disposed in fluid communication with corresponding fluid passages in the terminal connection structure. A plurality of pilot valves, provided within or adjacent the pig or terminal connection structure, are controlled by application of fluid pressure through the control conduits and serve to control communication of pressurized actuating fluid, carried in the protective conduit externally of the control conduits, to the actuating conduits of the subsea wellhead. The valve actuators are energized by the actuating fluid responsive to actuation of the pilot valves. An accumulator and pressure-balancing circuit are communicated to the fluid circuitry of each of the valve actuators in order to allow quick energized and deenergized actuation of the valve actuators. Fluid pressure is transferred from the accumulator and pressure-balancing circuitry to the actuator fluid supply of the fluid system upon reduction of pressure in the actuator fluid supply and such transfer may be aided by the hydrostatic head of the sea water in which the system is submerged.

3,640,300

FLUID AMPLIFIER FREQUENCY MULTIPLIER

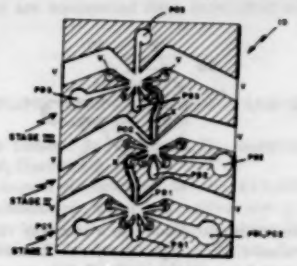
Willis A. Boothe, Scotia, and Salvatore Bottone, Jr., Schenectady, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 10, 1969, Ser. No. 883,711

Int. Cl. F15c *1/12*

U.S. Cl. 137—81.5 **2 Claims**

The fluid amplifier may be considered as including a device in which is formed the initial fluid flow pattern and which constitutes the main power input, the control inputs and the receiver, or output. At chosen points second fluid jets are admitted in chosen directions and under chosen flow rate and pressures to modify and control the main jet in a chosen or logical way. A third jet may be interposed from an opposite direction for further modification of the main jet. The main jet may be modified in such a way as to produce an output wave having a frequency that is twice the input frequency. Using two amplifier elements in said series produces an output four times the frequency of the input, N



amplifiers in series producing 2^N times the frequency of the input.

3,640,301

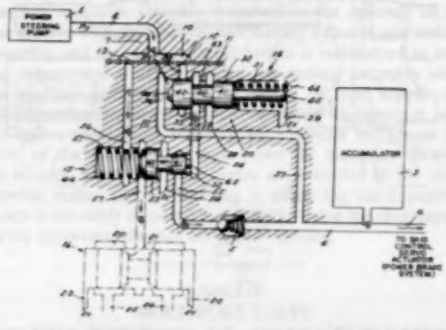
HYDRAULIC POWER SUPPLY

Zbigniew J. Jania, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 15, 1970, Ser. No. 46,077

Int. Cl. G05d *11/03*; F17d *3/00*; F01b *25/02*

U.S. Cl. 137—101 **6 Claims**



A common hydraulic power supply for a motor vehicle power-steering system and power brake system. The hydraulic power supply supplies hydraulic fluid from a power-steering pump continuously through a flow control valve to a power-steering system. The power brake system is supplied with hydraulic fluid from an accumulator as required. The accumulator is charged with hydraulic fluid by the power-steering pump. Accumulator charging occurs when the pressure in the accumulator falls below a predetermined value, and is accomplished by the diversion of a portion of the flow from the power steering pump to the power brake system. The diverted fluid passes through a pressure sensing valve, the flow control valve, a check valve, and into the accumulator.

3,640,302

SIPHONING DEVICE

Allan H. Willinger, New Rochelle, N.Y., assignor to Metaframe Corporation, Maywood, N.J.

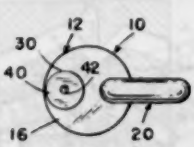
Filed Mar. 10, 1970, Ser. No. 18,112

Int. Cl. F04f *10/02*

U.S. Cl. 137—142 **10 Claims**

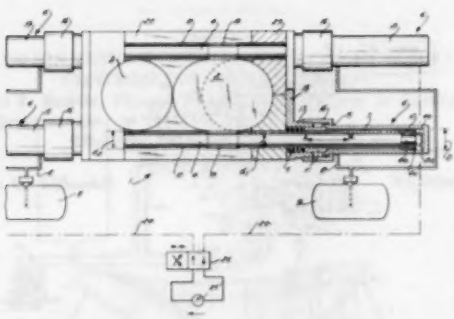
A siphoning device having a siphon tube connected to a cup-shaped member for transferring a liquid from a first receptacle containing the liquid to a second receptacle con-

taining a liquid. One end of the tube extends into the cup-shaped member. The other end of the tube is submerged in the liquid of the first receptacle, and the cup-shaped member is immersed in the liquid of the second receptacle. The cup-



shaped member is provided with a one-way valve to permit the compressed air to escape therefrom. Removing the liquid from the second receptacle causes the air pressure acting on the liquid in the first receptacle to start the siphoning action.

3,640,303
SLIDE VALVE FOR HIGH-VISCOSITY PUMPS
Cornelis Verheul, Amsterdam, Netherlands, assignor to Friedrich W. Schwing, Wanne-Eickel, Germany
Filed Feb. 3, 1970, Ser. No. 8,381
Claims priority, application Germany, Feb. 5, 1969, P 19 05 706.8
Int. Cl. F16k *41/00, 3/314*
U.S. Cl. 137—238 **13 Claims**



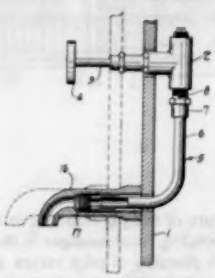
A slide valve for dense or viscous materials, e.g. concrete, has a slide element connected to a piston rod which extends out of the valve housing through a seal and carries a piston received in a cylinder which is clamped to the housing around the seal by a clamping nut. The cylinder has an outer actuation chamber while an inner annular chamber between the piston and the seal is a flushing compartment connected to a reservoir of liquid through a single duct. As the piston moves toward the seal, the liquid in the flushing compartment is expelled, taking with it any foreign matter which has gotten past the seal, and as the piston movement is reversed this compartment is filled with the liquid via this duct to flush the rod again. The valve element, valve guides, end stops, and sleeves surrounding the piston rods are all easily removable and replaceable to facilitate servicing of the valve.

3,640,304
INSERTABLE VALVE ASSEMBLY
Marvin L. Fox, 7310 S. W. Hermos Way, Tigard, Oreg., and James R. Parry, Route 2, Box 46, Newberg, Oreg.
Filed May 1, 1970, Ser. No. 33,825
Int. Cl. F16k *1/44*
U.S. Cl. 137—315 **6 Claims**

A valve assembly, is shown and described, as operatively disposed in a dental syringe. Resilient ring means are disposed about the assembly to frictionally engage the adjacent structure housing the valve assembly. A sleeve of the valve assembly defines an inner chamber for reception of the

pressurized media being controlled with a valve core being moveable within the sleeve for release of the pressurized fluid or air for ultimate discharge.

3,640,305
CONNECTION FOR SPOUT ADJUSTMENT
Stephen A. Young, c/o Stephen A. Young Corp., Flora, Ind.
Filed Apr. 24, 1969, Ser. No. 818,902. The portion of the term of the patent subsequent to July 15, 1985, has been disclaimed.
Int. Cl. F16l *5/00, 17/02*
U.S. Cl. 137—360 **3 Claims**



The disclosure herein relates to plumbing fittings and primarily to concealed plumbing fittings of the type in which a valve body is mounted behind a wall surface and provides for regulation of liquid flow outwardly from the wall surface through some kind of a connection, in this instance comprising an elbow at the outer end of which is provided a threaded section adapted to engage a corresponding threaded section of a spout, the threads providing for adjustment to compensate for varying positions of the valve within the wall and it being necessary to furnish some kind of sealing means to prevent leakage. The leakage in this instance is overcome by the provision of an O-ring section in the threaded section of the valve unit elbow upon which the O-rings are seated, the O-rings in turn engaging the threads in the spout to effect the leakage prevention and sought hereby.

3,640,306
PRESSURE RELIEF VALVE
Clarence L. Vogt, Burbank, Calif., assignor to Bobrick Aero Missile Products, North Hollywood, Calif.
Filed Oct. 19, 1970, Ser. No. 81,646
Int. Cl. F16k *15/03*
U.S. Cl. 137—512.1 **11 Claims**

A multiflapper relief valve wherein individual flapper valve members are sector shaped laying in a common plane and rotatable through an arc from the closed or seated position to the open position and wherein each of the flapper valve members are provided with a cricket spring of the leaf-type to preload them to a selected value, which value must be overcome by fluid in the system in which the relief valve is used in order to unseat the valve members. When the fluid pressure in the system is greater than the cracking pressure, unseating occurs and the cricket spring thereafter exerts a

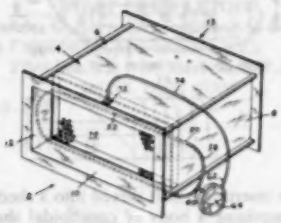
substantially insignificant, lower force in comparison once the flapper valve member is moved off of its seat and imparts

a snap opening and closing action to each of the sector-shaped valve members.

3,640,307
APPARATUS FOR BALANCING FLUID DISTRIBUTION SYSTEMS

Raymond J. Drzala, New Britain, Conn., assignor to Allied Thermal Corporation, New Britain, Conn.

Filed Feb. 24, 1970, Ser. No. 13,482
Int. Cl. F61k *37/00*; F16k *47/10*; F24f *13/14*
U.S. Cl. 137—557 **2 Claims**

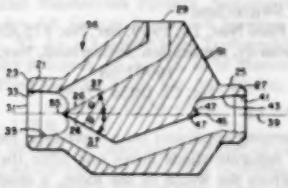


Apparatus for balancing the flow of a gaseous substance in the branch of a fluid distribution system comprising a set of variable gates to regulate the volume flow input, a screen to establish a pressure differential along the length of the unit and a pressure differential measuring system capable of detecting and measuring the pressure drop in the unit due to the screen as a function of the input flow rate and to allow regulation of the output flow by altering the input flow rate in accordance with prior calibration of the measuring system.

3,640,308
APPARATUS FOR DIVIDING AND RECOMBINING FLOW

Bruce Alfred Bydal, Martinsville, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 15, 1970, Ser. No. 28,743
Int. Cl. F17d *1/00*
U.S. Cl. 137—561 **2 Claims**

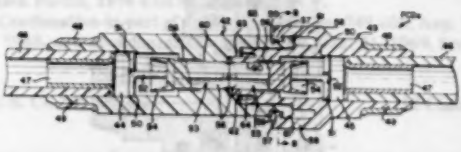


An apparatus for dividing a flowing multicomponent viscous stream into a plurality of sectors, each having the same weight percentage of each component as in the stream, includes a body member having an entrance and a plurality of exits connected by a plurality of passages. The passages, at one end, all intersect with the axis of the entrance at a common point and are equispaced from each other around the entrance axis.

3,640,309
FLUID COUPLING WITH CONNECTION AND SEALING FEATURE

Henry William Demler, Sr., Lebanon, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of application Ser. No. 613,608, Feb. 2, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 517,747, Dec. 30, 1965, now Patent No. 3,378,282. This application Jan. 16, 1970, Ser. No. 3,447
Int. Cl. F16l *37/28*
U.S. Cl. 137—614.04 **9 Claims**

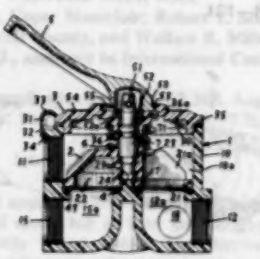


A fluid connection device comprises mateable connection sections having openings therein which are brought into communication when the sections are secured together. A valve member means is movably mounted in the opening of the one section with the opening also having a spacer and sealing assembly and the valve member means is maintained in sealing engagement with the spacer and sealing assembly when the member is connected to a source of fluid supply, the valve member means being moved out of engagement with the spacer and sealing assembly via a tubular section on the other of the mateable sections when the mateable sections are secured together. Guide means are provided on the valve member means and the opening in which the valve member means is movably disposed to guide the valve member means during movement thereof along this opening.

3,640,310
MULTIPORT VALVE

Giora Erlich, North Bergen, N.J., assignor to Hayward Manufacturing Company, Inc., Elizabeth, N.J.

Filed June 26, 1969, Ser. No. 836,795
Int. Cl. F16k *7/16*
U.S. Cl. 137—625.46 **11 Claims**



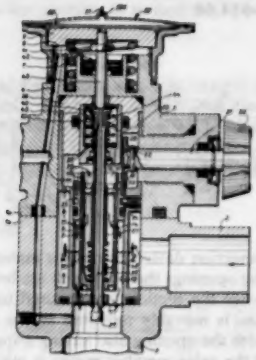
A multiport valve is provided having a manually operated rotor for selectively directing the flow from an inlet port to a desired outlet port. A high-pressure inlet port is positioned upstream of the rotor so that the inlet pressure biases the rotor against the seat to prevent the leakage of fluid in the selected position. The valve seat is a unitary resilient seal

which is disposed within a groove surrounding the entrance portion of each outlet port. The unitary seal effectively prevents leakage by utilizing a raised seating portion to seal against the rotor and a dovetail lower portion to seal against the sides of the groove.

3,640,311
CIRCULATING VALVES

Rudibert Gotzenberger, Feilbach, Germany, assignor to Ernst Flitsch, Feilbach, Germany

Continuation-in-part of application Ser. No. 712,457, Mar. 12, 1968, now abandoned. This application Apr. 27, 1970, Ser. No. 31,916
Int. Cl. F16k *31/145*
U.S. Cl. 137—637.4 **7 Claims**

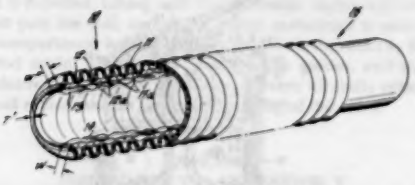


A valve for controlling the circulation of condensate in which two telescopically disposed shells are interposed between the inlet and the outlet of the valve, one of said shells being movable in axial direction relative to the valve body, the other being rotatable about its axis, the sidewalls of the shells having ports for the throughflow of the condensate, the opening of said ports being controlled by said axial and said rotational movement of said shells.

3,640,312
FLEXIBLE CORRUGATED TUBING HAVING IMPROVED PERFORMANCE CHARACTERISTICS

Joseph F. Bauman, Trenton; Edward Kurtz, Jr., Hamilton Square, both of N.J.; Adrian V. Cini, Bristol Township, and Robert E. Antrobus, Fairless Hills, both of Pa., assignors to Acme-Hamilton Manufacturing Corporation, Trenton, N.J.

Filed June 27, 1969, Ser. No. 837,164
Int. Cl. A47l *9/24*; F16l *11/12*
U.S. Cl. 138—121 **5 Claims**



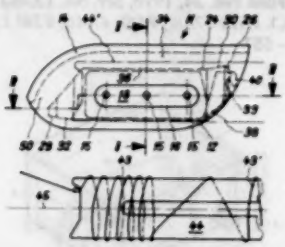
Flexible corrugated tubing, preferably formed of a thermoplastic material having a plurality of thin strips or beads of the same plastic material used to form the tubing. The stripes or beads are arranged at discrete angular positions along the interior surface of the tubing and extend from internal peak to internal peak for the length of the tubing section. The introduction of the thin plastic beads has no measurable effect upon the flexibility of the tubing and is extremely effective in eliminating whistling in operation.

The tubing may be formed in a continuous process, for example, in the manner described in U.S. Pat. No. 3,280,430, issued Oct. 25, 1966, which is further provided with means for either extruding beads of plastic material to form the plastic stripes or is provided with scraping means for scraping small portions of plastic material utilized to form the corrugated configuration and extending the scraped material from internal peak to internal peak along the length of the continuously formed tubing.

3,640,313
INSERTION ELEMENT FOR INSERTING WEFT THREADS ON A LOOM

Edgar H. Strauss, Ruti/Zurich, Switzerland, assignor to Ruti Machinery Works, Ltd., formerly Caspar Honegger, Ruti/Zurich, Switzerland

Filed Jan. 26, 1970, Ser. No. 5,837
Claims priority, application Switzerland, Feb. 19, 1969, 2492/69
Int. Cl. D03j *5/06*
U.S. Cl. 139—12 **14 Claims**



A shuttle for inserting a weft thread into a shed of a loom, the shuttle comprising a body of conchoidal shape, having two sidewalls that are connected along a closed edge portion of the body and are open over the remaining portion of the body; retaining means in the interior of said body for retaining a portion of thread of predetermined length in the form of a coil between said walls; and the interior of the body being so shaped that during its operation on the loom the interior is automatically cleaned of particles of fibers and like contaminants; said body defining a path for the removal of said particles and there being no obstruction along this path that inhibits the discharge of said particles therefrom. The portion of thread to be inserted is wound on a coil-forming member and then transferred to the shuttle by pushing the shuttle over the coil located on the coil-forming member in a direction at right angles to the axis of said member and by moving the shuttle away from the coil-forming member in a direction parallel with the axis of said member.

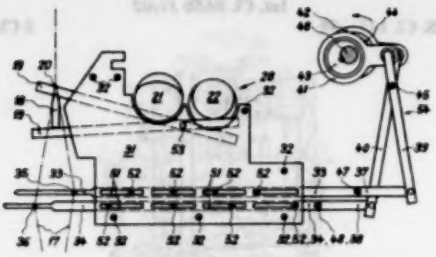
3,640,314
SHED-FORMING APPARATUS ON A LOOM

Edgar H. Strauss, Ruti/Zurich, Switzerland, assignor to Ruti Machinery Works, Ltd., formerly Caspar Honegger, Ruti/Zurich, Switzerland

Filed Nov. 10, 1969, Ser. No. 875,034
Claims priority, application Switzerland, Nov. 13, 1968, 16901/68
Int. Cl. D03d *47/26*
U.S. Cl. 139—12 **22 Claims**

A shed-forming apparatus on a wave-type loom wherein a plurality of separate sheds move one after the other simultaneously across the width of the loom, a shuttle carrying a weft thread moving in each of the separate sheds and the warp threads forming the sheds are actuated by heddles, the apparatus comprising a plurality of heddles divided into

groups which execute phase-displaced movements, the periodicity of these movements being repeated at intervals corresponding to the shuttle-pitchs; drive means for causing selected groups of heddles to execute these movements; and a movement-imparting element connected to those groups of

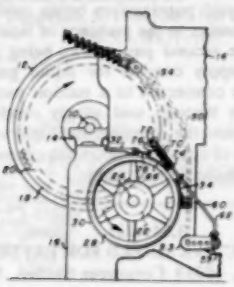


heddles driven by said drive means and to other heddles not driven by said drive means. The heddles and the movement-imparting elements linked therewith are disposed in one plane, are movable therein, and are arranged so that actuation of the selected group of heddles by the drive means also causes actuation of the other groups of heddles.

3,640,315
WARP BEAM LETOFF

Alfonso Tisdale, Gaffney, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Dec. 22, 1969, Ser. No. 887,464
Int. Cl. D03d 49/06
U.S. Cl. 139—107 **1 Claim**



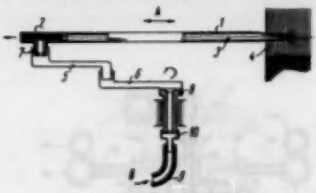
Apparatus to let the tension off of a loom warp beam as the warp yarn on the beam is being consumed by the loom.

3,640,316
RAPIER IN THE DEVICE FOR INSERTING WEFT THREAD INTO THE LOOM WARP SHED

Nikolai Ivanovich Makachev, ulitsa Tajurupy, 12, korpus 1, kv. 27; Alexei Nikolaevich Parshin, Nagarnaya ulitsa, 34, korpus 43, kv. 53; Georgy Sergeevich Smurov, Khoroshevskoe shosse, 92, kv. 43, and Alexei Trofimovich Stepanets, Leningradsky prospect, 48, kv. 78, all of Moscow, U.S.S.R.

Filed May 27, 1970, Ser. No. 40,936
Int. Cl. D03d 47/16
U.S. Cl. 139—127 R **2 Claims**

A rapier in devices for inserting weft thread into the loom warp shed, in which one end of a tube is connected to a jet pump generating therein a suction flow to take up the end of the weft thread. The suction flow is directed by a sleeve serving for the passage of air from the shed, and by a bushing located behind this sleeve in the direction of air movement therein, and partially embracing the sleeve, so as to form an



annular slit for the passage of compressed air supplied from a pressure source.

3,640,317
CLIP FOR CLOSING FRAGILE STUFFED CASINGS

Jack Panfili, 1576 61st St., Brooklyn, N.Y.

Continuation-in-part of application Ser. No. 749,404, Aug. 1, 1968, now abandoned. This application Mar. 21, 1969, Ser. No. 813,799
Int. Cl. B21f 45/22
U.S. Cl. 140—82 **12 Claims**

A clip for use in closing the ends of sausage casings and similar containers. The clip is formed as a U with legs having angularly bent portions. The zone of joinder of the legs with the base is work hardened to a degree that will resist bending by lateral forces which will produce bending at the angularly bent zones of the legs. In another form of the invention the clip is formed into a U and is of channel cross section. One leg of the U is dimensioned to slidably fit between the other legs of the U when the clip is applied to a casing. In either form of the invention the clip is preferably made of anodized aluminum or coated with a lubricant of synthetic resin or both and in each case dyed a suitable color.

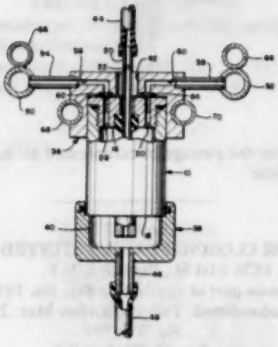
3,640,318
METHOD AND APPARATUS FOR FILLING A THERMAL MOTOR WITH WAX

Kalman Shmueli, Upper Montclair; Robert T. Scott, Boonton Township, Morris County, and Wallace R. Mills, Mountain Lake, all of N.J., assignors to International Controls Corp., Fairfield, N.J.

Continuation of application Ser. No. 753,368, Aug. 19, 1968, now abandoned. This application June 25, 1970, Ser. No. 56,057
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—11 **16 Claims**

A method and apparatus for filling a thermal motor with wax. The thermal motor has an inlet and outlet ports and it also has an axially bored piston. The thermal motor is oriented with the inlet and outlet ports located at the uppermost part of the motor. Liquid wax is then introduced through the inlet port and discharged through the outlet port. After the interior of the motor has become filled with liquid wax, a chilling fluid is directed through the piston to bring about progressive chilling and solidification of the wax from the lower toward the upper end of the thermal motor.

Thereafter, chilling is provided at the region of the outlet port to provide a wax plug at the outlet port, and finally, chilling is provided at the region of the inlet port to provide a wax plug at the inlet port. These operations are brought



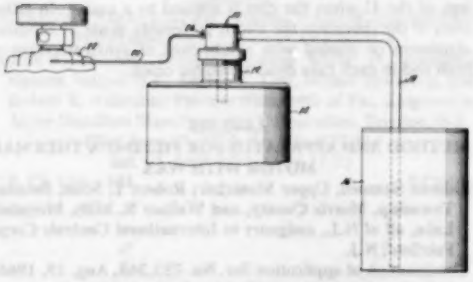
about by way of a suitable filling head having supply and discharge lines for the liquid wax. The filling head has passages chilled and cooled simultaneously with the chilling and cooling of the inlet and outlet port regions of the thermal motor by suitable temperature-control means.

3,640,319

VACUUM ACTUATED AUTOMATIC TRANSFER DEVICE

Kenneth O. Hougen, 3950 Virginia Road, Apt. 304, Long Beach, Calif.

Filed Aug. 21, 1969, Ser. No. 851,783
Int. Cl. B67d *5/00*
U.S. Cl. 141—42 **7 Claims**



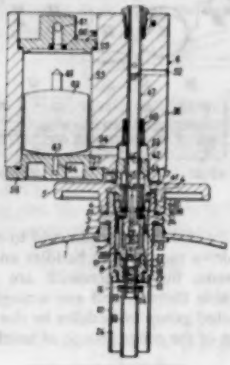
A transfer device for filling the fuel tank of a vehicle using a vacuum source such as the intake manifold of an internal combustion engine as the driving force. The transfer device forces the fuel into the fuel tank until the tank is full, at which time a buoyant member connected to a pivot arm actuates a valve to close off the vacuum line. The valve and buoyant member are in separate chambers of the transfer device so that fuel never contacts the valve. The pivot arm arrangement for actuating the valve assures dependable operation since both the valve and pivot pin are free from contamination by fuel sediments.

3,640,320

CONTAINER FILLING MEANS

Ludwig Elkuch, Gamprin, Bendern, Liechtenstein, assignor to Liongas Aktiengesellschaft, Bendern, Liechtenstein

Filed Jan. 26, 1970, Ser. No. 5,559
Claims priority, application Switzerland, Jan. 22, 1969, 970/69
Int. Cl. B65b *31/02*
U.S. Cl. 141—59 **5 Claims**



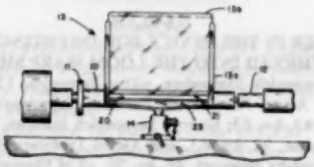
A filling device on a container for filling the same with a liquid gas comprises two parts adapted to be coupled to each other, the first of these parts being secured to the container and provided with two check valves having distinct flow paths which begin within the container at a certain level in the upper portion thereof. The second of said two parts comprises means for opening both check valves when the two parts are coupled together, and two separate passageways for liquid gas forming continuations of said two distinct flow paths, the first of said passageways being controlled by a valve which is responsive to the presence of liquid gas in the passageway and the second passageway being adapted for connection to a supply conduit for liquid gas. The first passageway may be connected to a suction pump whereby liquid gas is drawn through said supply conduit and the second passageway into the container until said valve responsive to the presence of liquid gas closes the connection of the first passageway with the suction pump.

3,640,321

PROTECTIVE SHIELD FOR LATHE

Charles L. Walton, 15014 Commerce Station, Minneapolis, Minn.

Filed May 15, 1970, Ser. No. 37,695
Int. Cl. B27c *7/00*
U.S. Cl. 142—55 **4 Claims**



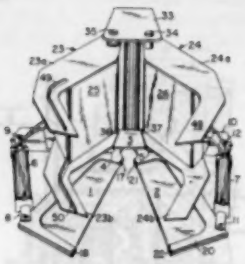
A protective transparent shield protects a lathe operator against flying chips and the like yet contains an opening through which the operator can pass a tool for working on the workpiece. The base of the shield frame is provided with a surface for guiding and resting the tool and also a groove for guidance and protection of the operator's hands as he manipulates the tool.

3,640,322

NIPPER APPARATUS FOR HARVESTING TREES

C. Andrew Allen, Savannah, Ga., assignor to S. A. Allen, Inc.

Filed June 26, 1970, Ser. No. 50,131
Int. Cl. A01g *23/02*
U.S. Cl. 144—34 E 3 Claims



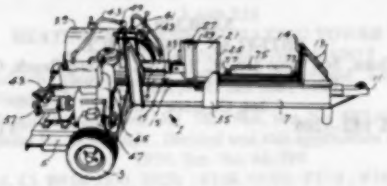
Nipper apparatus comprises a pair of pivotally mounted blades disposed in substantially the same plane and each having a straight cutting edge, a reinforcing rib disposed about the periphery of each of the blades and each rib being arranged with its ends disposed at the ends of the cutting edge of the associated blade so as to constitute an abutment for arresting cutting movement of the blades. Gripping claws are disposed immediately above the blades and serve to envelop and grip a tree to be cut, the gripping claws and blades being operated from a common source of fluid pressure.

3,640,323

APPARATUS FOR SPLITTING AND CHOPPING TIMBER

Gordon W. Heile, Farmington, Ill., assignor to Sawmill Hydraulics, Inc., Farmington, Ill.

Filed Nov. 5, 1969, Ser. No. 874,304
Int. Cl. B27l *7/00*
U.S. Cl. 144—193 A 9 Claims



Apparatus for splitting and chopping timber having a blade adapted to chop as well as split timber actuated by a hydraulic cylinder supplied with fluid under pressure by a variable-displacement constant-pressure hydraulic pump adapted automatically to increase the force exerted on the blade in response to increased resistance to chopping or splitting while decreasing the speed of travel of the blade and vice versa over the normal operating range of the apparatus.

3,640,324

HAMMER HEAD HAVING AN ANTISLIP AND WEAR-RESISTANT STRIKING FACE SURFACE

Laurence W. Porter, Hebron, Ill., assignor to Vaughan & Bushnell Mfg. Co., Hebron, Ill.

Filed Nov. 13, 1969, Ser. No. 876,300
Int. Cl. B25d *1/00*
U.S. Cl. 145—29 R 1 Claim

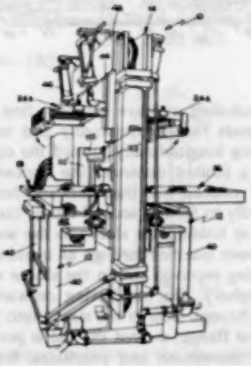
A forged steel hammer head including an impact head proper having a striking face on one end thereof is provided with a layer of tungsten carbide electrodeposited on the end, forming an outer surface on the striking face and penetrating the impact head proper, thereby providing an antislip and wear-resistant surface on the striking face.

3,640,325

PLATE SKINNING MACHINE

Martin L. Harlan, Grand Rapids; Jerry L. Davis, Rockford, and Lloyd A. Nyland, Macatawa, all of Mich., assignors to Wolverine World Wide, Inc., Rockford, Mich.

Filed July 22, 1970, Ser. No. 57,189
Int. Cl. A22c *17/12*
U.S. Cl. 146—241 16 Claims

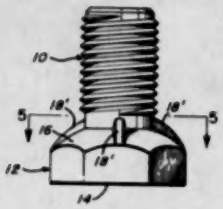


This specification describes a plate-type skinning machine for animal sides, with a unique arrangement and mounting of blade and pressure roller apparatus.

3,640,326
BOLT

Edward L. Brown, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed Oct. 17, 1969, Ser. No. 867,274
Int. Cl. F16b 39/282
U.S. Cl. 151—37 4 Claims

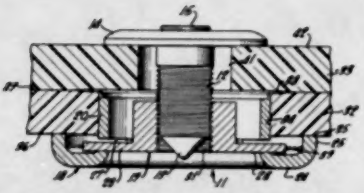


A bolt, for use with curved pieces having aligned apertures, including ribs of trapezoidal cross section on the underside of the bolt head for engaging a portion of one of the apertures to prevent rotation of the bolt while tightening a nut thereon.

3,640,327
FASTENER WITH FLOATING NUT

John Burt, Burbank, Calif., assignor to Deutsch Fastener Corp., Los Angeles, Calif.

Filed May 8, 1970, Ser. No. 35,853
Int. Cl. F16b 43/00
U.S. Cl. 151—41.74 12 Claims

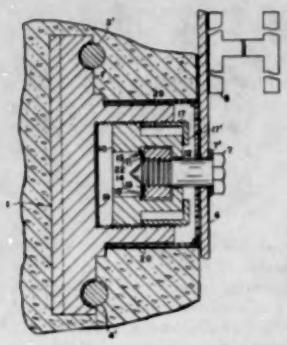


A fastener including a sleeve having a first flange at one end which extends radially outwardly and terminates in a portion extending longitudinally toward the opposite end of the sleeve for a limited distance, the opposite end of the sleeve being of reduced wall thickness and being adapted to be bent outwardly to form a second flange cooperating with the first flange in holding the sleeve to the workpiece when the sleeve has been inserted through an opening in the workpiece, a nut being received within the sleeve with clearance around its periphery, the nut having outwardly projecting tabs extending through slots in the sleeve into the space provided by the first flange, so that the nut is permitted limited lateral floating movement and precluded from substantial rotation, the bolt having a threaded shank with a pointed end for facilitating entry into the nut, and having a wide thin head provided with a central protrusion engaged by a tubular portion of the driving tool for aligning the driving tool with the head. The tubular portion of the driving tool is spring biased outwardly and is moved inwardly upon engagement with the head at the central portion thereof, while blades on the driving blade tool enter the slot in the bolt head.

3,640,328
MEANS FOR MOUNTING CONCRETE STRUCTURAL MEMBERS

Natale J. Tummarello, 2073 Hillside Ave., Bellmore, N.Y.

Filed Aug. 12, 1970, Ser. No. 63,123
Int. Cl. F16b 5/02, 39/00
U.S. Cl. 151—41.7 5 Claims

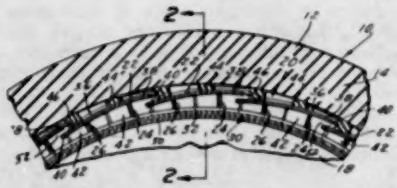


An adjustable mounting means is precast in the concrete structural member to be mounted. The adjustable mounting assembly consists of a first internally threaded hollow member anchored to the structural member. A second externally threaded member is mounted in the threads of the first member and the second member has a hollow interior space. A nut is magnetically mounted inside the interior space so that the nut may be moved in all directions both perpendicular to and along its axis in order to make proper alignment with a bolt mounted in a building frame.

3,640,329
ANTI-FLAT TIRE DEVICE

Alex Chien, 345 West 3rd St., Apt. No. 8, Long Beach, Calif.

Filed June 12, 1970, Ser. No. 45,766
Int. Cl. B60c 5/02
U.S. Cl. 152—205 3 Claims

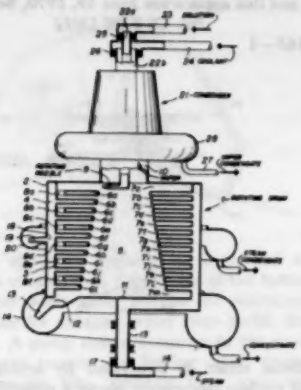


This invention provides a protective segmented metal band formed by a series of metal sheets or plates arranged within a pneumatic tire casing and disposed between the tire carcass and the pressurized area thereof. Each segmented plate is secured to a continuous annular belt of flexible material by a plurality of downwardly extending legs, said plate being relatively positioned independent of the carcass of the tire.

3,640,330
HEAT EXCHANGERS

Alain Javet, Geneva, Switzerland, assignor to The Battelle Development Corporation, Columbus, Ohio

Continuation of application Ser. No. 750,411, July 5, 1968, now abandoned. This application May 4, 1970, Ser. No. 48,793
Int. Cl. B01d *1/22, 3/08*
U.S. Cl. 159—6 8 Claims

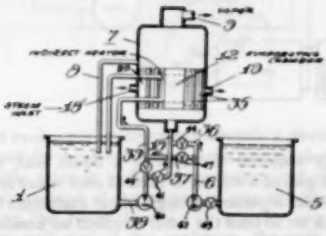


A hollow walled cylindrical revolving basket is provided with a heating medium in the hollow wall. To the inner wall are secured axially spaced flat, hollow rings whose successive inner diameters increase axially in liquid flow direction and into which rings the heating medium flows from the hollow wall. Alternate rings are provided with axial through passages at the inner wall connecting the channels between the rings. Liquid feed to be evaporated is injected into the channel between the ring with smallest inner diameter and the adjacent end wall of the basket. Concentrate is removed from the final channel and vapor is removed axially.

3,640,331
HEATING AND CONCENTRATING TOWER FOR PLATING WASTE RECOVERY UNIT

Aisaburo Yagishita, 5-2 Shinpo-cho 4-chome, Chigusa-ku, Nagoya, Japan

Original application Oct. 18, 1966, Ser. No. 587,607, now Patent No. 3,542,651. Divided and this application Aug. 24, 1970, Ser. No. 66,399
Int. Cl. B01d *1/00;* E03b ; F16k *49/00;* F17d ; F16l *53/00;* B01k *3/00*
U.S. Cl. 159—23 5 Claims

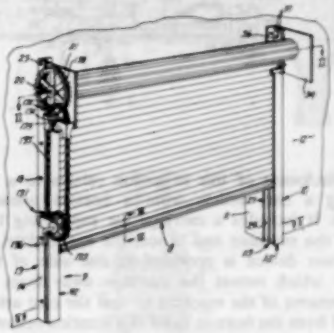


In the reclaiming of plating wastes containing chromic acid and the like, the rinse liquid from the first of a plurality of washtubs into which plated articles are dipped successively to rinse off the plating solution, is sucked into a tower, heated by steam to concentrate it to plating strength, and then is returned to the plating tank. The plating solution is also pumped from the plating tank into the tower where it is heated and recirculated back to the plating tank to maintain the solution in the tank at an elevated temperature. Means is also provided to pump the rinse liquid directly from the first washtub to the plating tank, if the rinse liquid in said first tub does not require concentration to raise it to plating strength.

3,640,332
ROLL-TYPE DOOR

John J. Luby, Duncanville, and Paul E. Pemberton, Dallas, both of Tex., assignors to Overhead Door Corporation, Dallas, Tex.

Filed Nov. 12, 1969, Ser. No. 875,914
Int. Cl. E06b *9/08*
U.S. Cl. 160—133 5 Claims

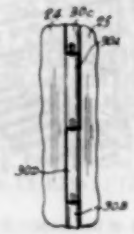


A roll-type door for closing an opening in a wall and having a plurality of horizontally hinged, relatively narrow slats, the lengthwise ends of which move along upright guide tracks mounted upon the wall adjacent the opposite sides of the opening. The door, when in opened position, is wound upon a plurality of flanged disks, some of which are secured to a shaft rotatably supported above the opening. Spring-biased counterbalance means yieldably resists downward unrolling movement of the door which can be effected manually, by a chain drive, or by a shaft and gear arrangement.

3,640,333
FOLDING DOOR OR THE LIKE

Lucien Leclerc, 79, 7ieme, L'Islet, Quebec, Canada

Filed June 25, 1970, Ser. No. 49,677
Int. Cl. E05d *1/06*
U.S. Cl. 160—183 5 Claims



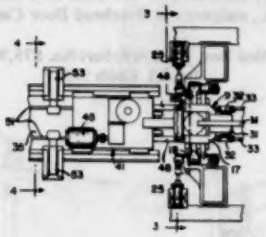
A folding door, partition or the like where each articulated panel is provided on its opposite side edges with a series of vertically aligned spaced-apart bead moldings interengageable with corresponding bead moldings of an adjacent panel by means of a snap-in locking movement; a semispheric seat provided on the upper edge of one bead molding of one panel receives the rounded head of a spring-biased plunger provided in and slidable in and out of the lower edge of the bead molding of the adjacent panel.

3,640,334

CASTING APPARATUS WITH MEANS FOR REMOVING INGOT ON BOTTOM MOLD ELEMENTS

Maurice Paul Sieger, Pittsburgh, Pa., assignor to United Engineering and Foundry Company, Pittsburgh, Pa.

Filed June 1, 1966, Ser. No. 554,603
Int. Cl. B22d *29/00, 45/00*
U.S. Cl. 164—269 9 Claims



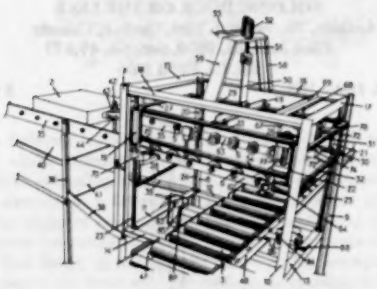
The disclosure of this invention relates to a device for removing a cast article from a bottom pressure-casting machine. It includes a carriage for supporting the bottom mold of the machine and hence, the cast article. A tractor-type power device is provided at one side of the casting machine which moves the carriage away from the upper mold elements of the machine so that the cast article can be removed from the bottom mold at a location remote from the upper mold elements.

3,640,335

PLANT FOR CLOSURE OF FOUNDRY MOLDS

Pierre Justin Auguste Darbonville, 95, Rue Anatole-France, 45 Fleury-les-Aubrais, France

Filed May 25, 1970, Ser. No. 40,053
Claims priority, application France, June 3, 1969, 6918139
Int. Cl. B22d *33/04*
U.S. Cl. 164—339 11 Claims



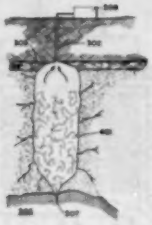
A plant for closure of foundry molds which comprise upper and lower halves, said plant comprising essentially a rolling track sloping at a shallow inclination, which by gravity conveys the lower halves of the molds to a positioning and closing station and which removes the molds after closure, a framework arranged over said rolling track and acting as a support for a device for transfer of the upper halves of the molds, coordinated with a device for infeed of the said halves, and means of ensuring the displacement of the transfer device in two directions.

3,640,336

RECOVERY OF GEOTHERMAL ENERGY BY MEANS OF UNDERGROUND NUCLEAR DETONATIONS

Rod P. Dixon, Salt Lake City, Utah, assignor to The United States of America as represented by the United States Atomic Energy Commission

Original application Jan. 30, 1969, Ser. No. 795,190, now Patent No. 3,608,636, dated Sept. 28, 1971, which is a continuation-in-part of application Ser. No. 734,661, June 5, 1968, and a continuation-in-part of 541,810, Apr. 11, 1966. Divided and this application June 19, 1970, Ser. No. 47,699
Int. Cl. F28f *13/12*
U.S. Cl. 165—1 1 Claim



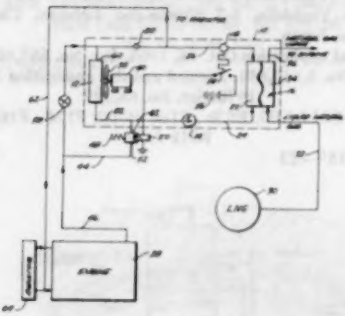
Geothermal steam is generated by setting off an underground nuclear detonation above a naturally hot stratum of igneous rock and thereafter introducing water into the formation above the hot stratum which has been made permeable by the nuclear detonation.

3,640,337

USE OF THE HEAT OF VAPORIZATION OF A FUEL AS AN AIR-CONDITIONING MEDIUM FOR A VEHICLE

Robert W. McJones, 529 Via Del Monte, Palos Verdes Estates, Calif.

Filed Mar. 13, 1970, Ser. No. 19,279
Int. Cl. B60h *3/04*
U.S. Cl. 165—23 6 Claims



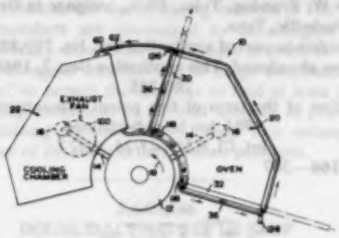
The energy required to vaporize a liquid fuel, such as liquid natural gas, of a vehicle is used to cool water in a loop. The cooled water is passed through a heat exchanger for heat exchange with air to cool the latter to effect air conditioning. A thermostatically controlled valve admits engine-cooling water to the loop when there is a danger of freezing of the water in the loop. The loop is also used when it is desired to heat the vehicle. During heating, engine-cooling water is admitted to the heat exchanger, passes through the loop to perform its vaporizing function, and then goes out a recirculating line for return to the radiator.

3,640,338

METHOD OF AND APPARATUS FOR COOLING OF ROTATIONAL CASTING APPARATUS

Alden C. Boyce, Stow, Ohio, assignor to Rota-Matic, Inc., Summit, Ohio

Filed Apr. 9, 1970, Ser. No. 26,860
Int. Cl. F25b 29/00
U.S. Cl. 165—48 5 Claims



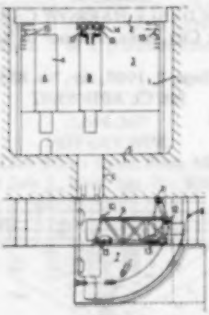
The casting apparatus includes an oven and a cooling chamber and a cooling tank is provided at the bottom of the cooling chamber while spray nozzles are positioned in the cooling chamber for spraying water onto molds therein for cooling action. A pump means connects to the cooling tank and to the spray nozzles for forcing water therethrough, which pump means also connects to a water-circulating system connecting to the oven doors for circulating cooling water therethrough. Improved oven door seal means are present. The invention also relates to a method of circulation of mold-cooling water.

3,640,339

HEAT EXCHANGER ARRANGEMENT

Pierre H. Pacault, Ville d'Avray, and Albert Dostantni, Avon, both of France, assignors to Babcock & Wilcox, Limited, London, England

Filed May 13, 1968, Ser. No.
Claims priority, application France, May 12, 1967, 106188
Int. Cl. F28f 7/00
U.S. Cl. 165—76 9 Claims



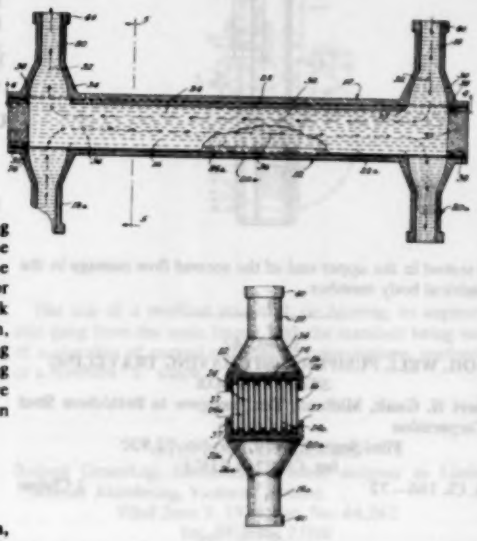
A heat exchanger arrangement wherein a plurality of cylindrical modular heat exchanger units are stacked upright in side-by-side relation within an enclosure and can be transferred into and out of the enclosure, one at a time, through a passage in the floor thereof. To transfer any given heat exchanger unit out of the enclosure, the unit is detached from its base, hoisted by an overhead travelling crane into a position overlying the floor passage and then lowered vertically into a basculating bridge underneath the floor. The bridge is then tilted into a horizontal attitude to discharge the unit. Transfer of a unit into the enclosure is accomplished by following the foregoing procedure in reverse order.

3,640,340

HEAT EXCHANGE DEVICE WITH CONVOLUTED HEAT TRANSFER WALL

Ronald James Leonard, Elk Grove Village, and Fred Michael Cohen, Chicago, both of Ill., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Nov. 20, 1970, Ser. No. 91,477
Int. Cl. F28b 3/00
U.S. Cl. 165—166 5 Claims



A heat exchanger device with a convoluted heat transfer wall to define a first and second set of flow channel defining pockets having oppositely opening mouths. Each set of pocket mouths communicates with a separate fluid inlet and fluid outlet means disposed adjacent opposite ends of the pocket mouths. Sets of continuous ridges fit into the pocket mouths between each fluid inlet and outlet to provide flow channels of unvarying width by preventing transverse movement of the convolutions of the heat transfer wall, as well as to seal the pocket mouths between each fluid inlet and outlet.

3,640,341

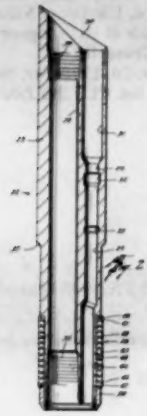
APPARATUS FOR COMPLETING PLURAL ZONE OIL AND GAS WELLS

Britt O. Braddick, Houston; Hiram E. Lindsey, Jr., Midland, and Charles J. McKiearnan, Odessa, all of Tex., assignors to Texas Iron Works, Inc., Houston, Tex.

Filed Nov. 6, 1969, Ser. No. 874,617
Int. Cl. E21b 33/12
U.S. Cl. 166—115 9 Claims

A tubular receptacle is connected in a string of permanent production liner at a point at which the production tubing for an upper one of two different subsurface producing zones is to be terminated. The interior of the receptacle is coated with Teflon. A first of two longitudinal flow passages in a cylindrical body member is connected at an intermediate point in a string of production tubing for the lower of the two producing zones and such tubing string is run into the well bore to seat the cylindrical body member in the liner receptacle. The cylindrical body member has resilient annular seal means on the exterior thereof for providing a fluidtight seal

between the liner string receptacle and the body member. The tubing string for the upper zOne is run into the well bore



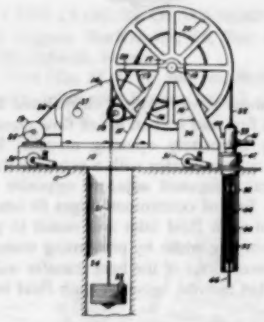
and seated in the upper end of the second flow passage in the cylindrical body member.

3,640,342

OIL WELL PUMPING UNIT HAVING TRAVELING STUFFING BOX

Robert H. Gault, Midland, Tex., assignor to Bethlehem Steel Corporation

Filed Sept. 4, 1970, Ser. No. 72,930
Int. Cl. E21b *33/03*
U.S. Cl. 166—72 **2 Claims**



An efficient long-stroke pumping apparatus for oil wells. This apparatus comprises the combination of a low and relatively inexpensive supporting structure, an upright stroking wheel or sheave mounted thereon and driven near the ground level, and below-ground counterweight and traveling-seal means for actuating a pumping string. Said seal means reciprocate vertically in a polished pipe fixed within the well tubing, and provide protection against corrosive well fluids to the pumping cable actuated by the stroking wheel.

3,640,343

STABILIZATION OF HARD SHALY FORMATIONS WITH ALKALI METAL SILICATE

Henry C. H. Darley, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed May 20, 1970, Ser. No. 39,676
Int. Cl. E21b *21/04, 33/138*
U.S. Cl. 166—292 **10 Claims**

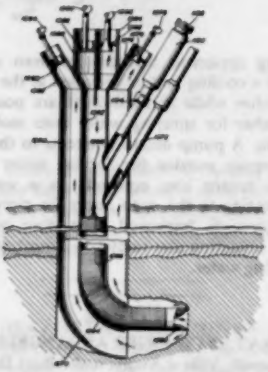
An improved method for stabilizing hard shaly earth formations comprising treatment of said formations with a low viscosity fluid consisting of an aqueous liquid containing a minor amount of a water-soluble alkali metal silicate having a pH in the range of from about 11 to about 12 and preferably between about 11.1 and 11.4.

3,640,344

FRACTURING AND SCAVENGING FORMATIONS WITH FLUIDS CONTAINING LIQUEFIABLE GASES AND ACIDIZING AGENTS

Clarence W. Brandon, Tulsa, Okla., assignor to Orpha Brandon, Nashville, Tenn.

Continuation-in-part of application Ser. No. 719,883, Apr. 9, 1968, now abandoned. This application Dec. 2, 1968, Ser. No. 780,385
The portion of the term of this patent subsequent to Feb. 7, 1984, has been disclaimed.
Int. Cl. E21b *43/26, 43/27*
U.S. Cl. 166—307 **60 Claims**



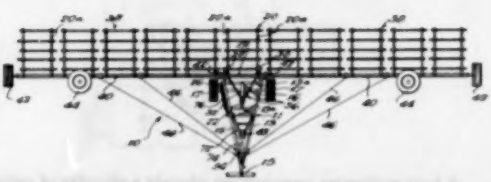
A method of fracturing formation with liquefiable gases, liquefiable gases and acidizing agents, and cleansing and scavenging of formations whereby energy waves and high-frequency vibrations may assist in the above.

3,640,345

FOLDABLE HARROW CART

Harry Sosalla, Sac City, Iowa, assignor to Noble Manufacturing Company

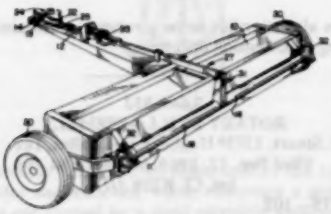
Filed Sept. 8, 1969, Ser. No. 855,840
Int. Cl. A01b *65/02*
U.S. Cl. 172—311 **9 Claims**



A foldable sectional tow-type implement, including a wheel cart having a centrally located drawbar revolvably mounted on a horizontal axis extending transversely of the direction of travel, and a pair of outboard sections interconnected to the centrally located drawbar and each being revolvable with the drawbar and swingable in a fore-and-aft direction relative thereto when revolved to a vertical transport position. Each of the drawbars serves to support an earthworking tool so that when the drawbars are in an operative position, the earthworking tools engage the surface of

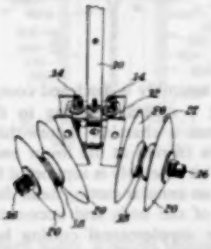
the ground and when the drawbars are swung to an inoperative position, the associated earthworking tools are raised to an inoperative or transport position. Flexible retaining members connect and support the outboard sections to the cart forward of the sections when the implement is in its operative position. The retaining members may be released when the tools are in the raised inoperative position to permit the outboard sections to be folded. The mechanism for revolving the drawbars and raising the tools is wholly independent of the release mechanism for the retaining members. The flexible retaining members are connected to an elongate release member pivotally connected to the cart in front of the sections. The elongate member has a hinge intermediate the ends thereof to permit the member to fold at least partially during folding movement of the end sections to prevent the flexible retaining members from rising into entanglement with portions of the tools in their folded positions.

3,640,346
DOUBLE-ACTING DEPTH STOP
Jerome L. Fueslein, Linden, Calif., assignor to International Harvester Company, Chicago, Ill.
Filed Dec. 29, 1969, Ser. No. 888,685
Int. Cl. A01b *63/14, 63/22, 63/16*
U.S. Cl. 172—318 **3 Claims**



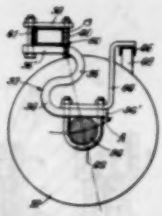
An implement having a scraping or leveling blade is provided with end wheels carried on arms mounted on a rockshaft in trailing relation behind the blade when used for scraping, the wheels being optionally disposable at the sides of the blade with the arms extending forwardly when the blade is used in forming dams and the like for irrigation purposes. Power transmission means for rocking the shaft is effective in either position of the wheels to rock the shaft, raise the blade, and return it to a predetermined operating position.

3,640,347
ROTARY HOE
Harry T. Miller, 2209 Miller Road, Flint, Mich.
Filed July 1, 1969, Ser. No. 838,147
Int. Cl. A01b *1/00*
U.S. Cl. 172—349 **2 Claims**



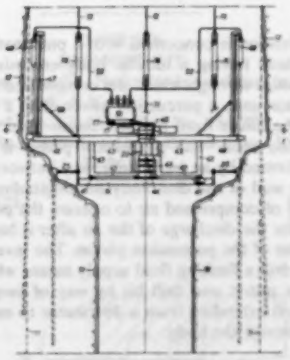
A manually operable hoe having a handle, a frame and rotary discs on caster axles extending outward angularly from the frame. The hoe provides the same rolling action as an ordinary farm disc.

3,640,348
S-SHAPED STANDARD
George E. Womble, Kewanee, Ill., assignor to Kewanee Machinery & Conveyor Company, Kewanee, Ill.
Filed Feb. 2, 1970, Ser. No. 7,614
Int. Cl. A01b *5/04, 61/04*
U.S. Cl. 172—573 **3 Claims**



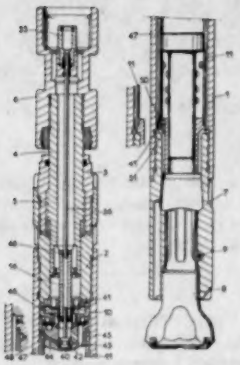
The use of a resilient standard, or bearing, to support a disc gang from the main frame, with the standard being made of a plurality of curved portions or convolutions, preferably of a reversed "S" shape.

3,640,349
STOPPING APPARATUS
Roland Granskog, Skelleftea, Sweden, assignor to Linden-Alimak Aktiebolag, Vasteras, Sweden
Filed June 8, 1970, Ser. No. 44,262
Int. Cl. E21c *23/00*
U.S. Cl. 173—32 **3 Claims**



The invention relates to an improvement in stopping apparatus permitting boreholes to be made with great accuracy and requiring little manpower attendance, said apparatus comprising a movable platform with lifting jacks thereon for fixing it in a horizontal position, and a plurality of arms each of which is articulated to a central stud on the platform, is swingable in a substantially horizontal plane, is adapted for carrying drilling means and comprises two telescopic parts tivvely to each other and for indicating the degree of their relative telescopic displacement.

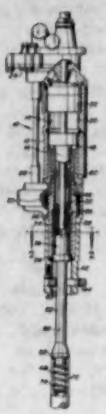
3,640,350
PNEUMATIC DRILL FOR BORING
Marcel Stenuick, Fontaine L'Eveque, Belgium, assignor to S.P.R.L. Stenuick Freres, Hainaut, Belgium
Filed Feb. 16, 1970, Ser. No. 11,588
Claims priority, application France, May 23, 1969, 6916870
Int. Cl. E21b *1/06*
U.S. Cl. 173—61 **3 Claims**



The invention is concerned with a pneumatic drill for use in a borehole having a tubular body enclosing a shock-absorbing piston through which the compressed air is supplied, a distributor unit, a percussion piston, and a drill bit which receives the blows from the percussion piston and transmits them to the rock. The percussion piston is movable in a cylinder formed by an inner liner, and between the liner and the inside wall of the drill body lie longitudinal passages for the supply of compressed air to operate the piston and other passages for the discharge of the air after it has acted on one of the faces of the percussion piston. The invention provides in such a drill a flushing fluid supply means which bypass the percussion piston and drill bit by way of longitudinal ducts for the fluid extending from a distributor to escape ducts extending through the body.

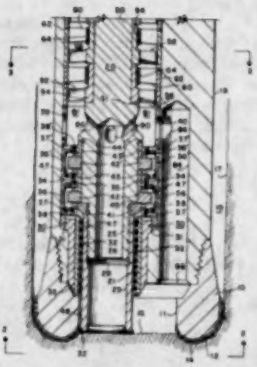
3,640,351
FORCE PULSE SHAPING MEMBER FOR PERCUSSION TOOL
Merton W. Coyne, Arvada, and Dieter K. Palauro, Denver, both of Colo., assignors to Gardner-Denver Company, Quincy, Ill.
Filed May 18, 1970, Ser. No. 38,422
Int. Cl. B25d *9/00;* **E21b** *17/00*
U.S. Cl. 173—105 **7 Claims**

A member comprising the shank or an integral shank-drill rod for a percussion rock drill and having a force-deflection or stiffness characteristic similar to the effective stiffness of the earth formation to be penetrated. The member is adapted to be removably inserted into the rock drill in blow-receiving relationship with a reciprocating hammer element. The



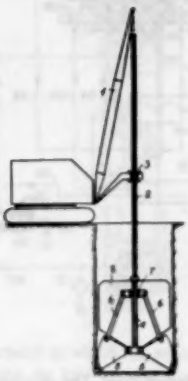
member is also operable to be a rotation transmitting means for rotating an extension drill string.

3,640,352
ROTARY DRILL ASSEMBLY
Robert W. Stuart, 13739 Hughes Lane, Dallas, Tex.
Filed Dec. 12, 1969, Ser. No. 884,494
Int. Cl. E21b *3/12*
U.S. Cl. 175—107 **8 Claims**



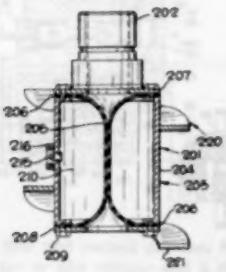
A rotary drill bit assembly is disclosed comprising a cylindrical body having a central opening in the lower face thereof which defines a chamber therewithin. An annular main cutting head is carried at the lower end of the body, and a supplemental bit assembly is supported from within the chamber which has an annular cutting head disposed perpendicular to the axis of the body and eccentric thereto. The outer radius of the supplemental cutting head and inner radius of the main cutting head substantially coincide along a line parallel to the body axis, with the outer radius of the supplemental head also extending at least to the axis of the central opening. Means are provided for rotating the supplemental cutting head relative to the main cutting head.

3,640,353
APPARATUS FOR EXCAVATION OF DEEP HOLES AND TRENCHES
Giuseppe Botto, c/o Costruzioni Cemento Compresso Fondisa S.p.A. Corso Europa 11, Milan, Italy
Filed Jan. 16, 1969, Ser. No. 791,701
Claims priority, application Italy, Oct. 23, 1968, 22880 A/68
Int. Cl. E21b 27/00
U.S. Cl. 175—202 1 Claim



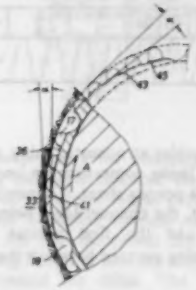
This disclosure relates to an apparatus for the excavation of deep holes and trenches, which comprises a grab bucket whose jaws are carried by a rigid rotatable support bar and are connected by a pair of arms to a sleeve member which is screwed onto a threaded end portion of said support bar.

3,640,354
HOLLOW-STEM AUGER HEAD WITH SEAL
Charles L. Rassieur, University City, Mo., assignor to Central Mine Equipment Company, St. Louis, Mo.
Filed Nov. 24, 1969, Ser. No. 879,239
Int. Cl. E21b 27/00
U.S. Cl. 175—243 5 Claims



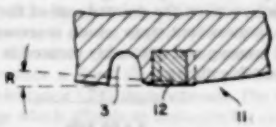
In a hollow-stem auger, wherein sampling tools are to be used through the hollow auger passage, a flexible seal is provided in the head which prevents or inhibits sand and the like from moving into the auger passage, but which permits a sampling tool to pass through.

3,640,355
DRILL BIT
Maurice P. Lebourg, 3700 Greenway Plaza Drive, Houston, Tex.
Filed June 4, 1970, Ser. No. 43,350
Int. Cl. E21b 9/36
U.S. Cl. 175—329 8 Claims



A rotary drill bit design of the type adaptable to rotary diamond-drilling bits or the like having a drilling face crossed by a number of fluid passageways to provide drilling lands on which cutting elements, such as diamonds, are mounted employs a construction wherein the matrix portion of each drilling land defines a wedgelike volume open in the direction of bit rotation with respect to the drilling surface or gage surface defined by the exposed portions of the cutting elements upon rotation of the bit. Accordingly, upon rotation of the bit, drilling fluid is subjected to an increasing pressure gradient in this wedgelike volume between the matrix of the bit and the formation being drilled to assist in preventing differential sticking and to create a hydraulic pressure pattern which assists in rapid drilling.

3,640,356
DIAMOND BIT
Robijn Feenstra, Rijswijk, Netherlands, assignor to Shell Oil Company, New York, N.Y.
Filed Dec. 12, 1969, Ser. No. 884,396
Claims priority, application Great Britain, Apr. 30, 1969, 22,061/69
Int. Cl. E21b 9/36
U.S. Cl. 175—329 10 Claims



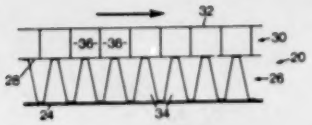
A diamond bit, the diamonds in the sidewall thereof being set in a blunt position in a direction radial to the central axis of the bit as well as in a cutting position in a direction tangential to a helical line passing through the cutting tip of the diamond and having a central axis coinciding with the central axis of the bit.

3,640,357

ACOUSTIC LININGS

Anthony George Kitching, Derby, and Mervyn Brown, Ticknall, both of England, assignors to Rolls Royce Limited, Derby, England

Filed Feb. 26, 1971, Ser. No. 119,308
Int. Cl. B64d *33/06*; **E04b** *1/84*; **F01n** *1/10*
U.S. Cl. 181—33 G **7 Claims**



The invention provides an acoustic lining, suitable for a gas turbine engine, the lining comprising an impervious sheet, a channel layer, a first porous sheet, a honeycomb layer and a second porous sheet, the channel layer being secured to the impervious sheet and the first porous sheet and the honeycomb layer being secured between the first and second porous sheets.

3,640,358

UNIVERSAL GAFF GUARD

Kenneth J. Smith, 12101 West Rawson Ave., Franklin, Wis.

Filed Aug. 4, 1970, Ser. No. 60,897
Int. Cl. A63b *27/02*
U.S. Cl. 182—221 **11 Claims**

A universal guard assembly for the gaff of a climber, such as utilized by utility and telephone linemen. The guard assembly includes a telescopically adjustable clamp which is received on the leg iron of the climber, a generally cylindrical metal guard housing having a nonmetal, friction resistant insert which receives the pointed end of the climber gaff and a flexible, nonresilient strap which is secured at one end to the guard housing and releasably secured at the opposite end to the adjustable clamp.

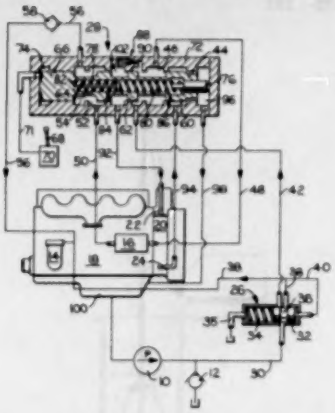
3,640,359

CONTROL SYSTEM FOR HYDRODYNAMIC RETARDER

Richard B. Clark, Washington; Hugh C. Morris, Peoria, and Gerald E. Whitehurst, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 20, 1970, Ser. No. 4,338
Int. Cl. B60k *29/02*; **F16d** *57/00*
U.S. Cl. 192—3 R **11 Claims**

A control system is provided for use with a hydrodynamic retarder for providing braking to a vehicle by using engine lubricant as the working fluid. The system comprises a first pressure responsive, priority valve which functions to direct engine lubricant to a second, control valve from the engine lubricant pump only after the pressure in the engine lubricant system has achieved a sufficiently high level to supply the engine's requirements. In another embodiment, the first valve meters lubricant to both the engine and retarder at the same



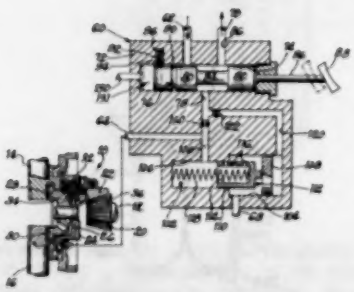
time by means of metering slots. The second control valve is operator-actuated and functions to direct lubricant through the heat exchanger, the lubricant filter, and then to the engine in one mode, or additionally by way of a hydrodynamic retarder in a second mode and thus to provide braking for the vehicle.

3,640,360

DIFFERENTIAL LOCK WITH PRESSURE MODULATING EXHAUST VALVE

William R. Dollase, Racine, Wis., assignor to J. I. Case Company

Filed Oct. 17, 1969, Ser. No. 867,281
Int. Cl. F16h *57/10*
U.S. Cl. 192—4 A **10 Claims**

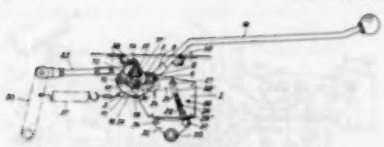


A control system for a differential having first and second output shafts and hydraulic brakes for the respective shafts. The control system includes a friction device for locking and unlocking the differential and a valve which progressively pressurizes the friction device in timed relation to initial supply of pressured fluid from a source to the valve. The valve cooperates with the brakes and releases the friction device whenever either of the brakes is actuated.

3,640,361
FRICTION CLUTCH ASSEMBLY
Paul Spichala, Schweinfurt, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany
Filed May 11, 1970, Ser. No. 35,951
Claims priority, application Germany, May 20, 1969, G 69 20 201
Int. Cl. F16d 13/58
U.S. Cl. 192—70.18 9 Claims

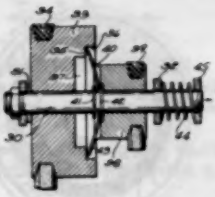
In a friction clutch in which the pressure plate is secured to the clutch casing by leaf springs normally extending in a common radial plane and elongated approximately tangentially to a circle about the clutch axis, the springs are fastened to the pressure plate, and axial movement of the pressure plate relative to the casing under the pressure of the clutch spring is limited by tubular fasteners passing through openings in the plate, the leaf springs, and the casing. The fasteners have terminal flanges and a central annular bead, the pressure plate and a spring are confined between one flange and the bead, and the casing is free to move between the bead and the other flange on each fastener.

3,640,362
CLUTCH CONTROLS FOR POWER TAKEOFF SHAFTS OF TRACTOR OR LIKE VEHICLES
Richard Six, 8011 Forstern, Sackgasse 2, Germany
Filed Aug. 3, 1970, Ser. No. 60,588
Claims priority, application Germany, Aug. 6, 1969, P 19 39 951.0
Int. Cl. F16d 21/08
U.S. Cl. 192—48.7 7 Claims



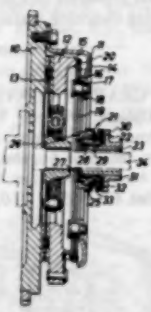
Controls for first and second clutches between a power drive of a tractor or like vehicle and a driving section of power takeoff shaft and between the driving and driven sections of the power takeoff shaft, comprising a lever-actuated crankshaft with first and second crank pins, and operating connections between the first crank pin and first clutch and between the second crank pin and second clutch, with the crank pins being so angularly displaced that the first clutch is actuated prior to and after each actuation of the second clutch.

3,640,363
FRICTION COUPLING
James R. Spalding, Wauwatosa, Wis., assignor to General Electric Company
Filed Dec. 23, 1969, Ser. No. 887,476
Int. Cl. F16d 11/06, 13/14, 51/00
U.S. Cl. 192—65 3 Claims



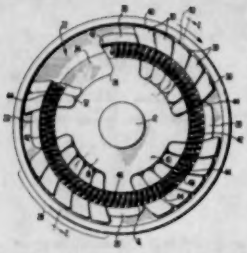
The invention provides for coupling or uncoupling adjacent relatively moveable machine elements. One element has a circular or elongated recess defining frictionally engageable surfaces. The other element carries a curved spring member which fits into the recess loosely normally and is adapted for being flattened and expanded by moving one of the elements toward the other. The ends of the spring member thereby grip the frictionally engageable surfaces and couple the two elements together.

3,640,364
CLUTCH BEARING WITH MAGNETIC SUPPORT
Norman Utton, Leamington Spa, England, assignor to Automotive Products Company Limited, Leamington Spa, England
Filed Dec. 4, 1969, Ser. No. 881,993
Claims priority, application Great Britain, Dec. 9, 1968, 58,339/68
Int. Cl. F16d 23/14
U.S. Cl. 192—98 8 Claims



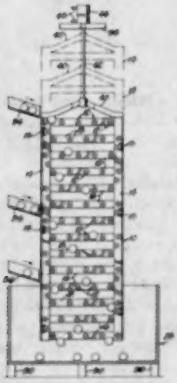
One race (25) of a release bearing (21) of a friction clutch release mechanism acts on the fingers (19) of a diaphragm spring (14) and the other race (27) is mounted on a bush (28) which surrounds a fixed sleeve (23) of nonmagnetic material with a clearance (29) therebetween. The bush (28) has a radial flange which affords an armature for cooperation with a permanent magnet (32) carried by a carrier (22) which is slidably mounted on the sleeve (23). The permanent magnet (32) may be a ring magnet or a circumferentially spaced array of separate magnets and the face of the or each magnet may be flush with the surrounding face of the carrier. In use of the friction clutch release mechanism, if the clutch and the fixed guide are not coaxial, the permanent magnet (32) permits the release bearing (21) to move radially relative to the carrier (22) into a position in which it is concentric with the clutch, and holds the release bearing (21) concentric with the clutch.

3,640,365
MULTIPLE SEGMENT CENTRIFUGAL CLUTCH
Charles Frederick Henry, Carson, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.
Filed Oct. 30, 1970, Ser. No. 85,345
Int. Cl. F16d 43/24
U.S. Cl. 192—105 BA 14 Claims



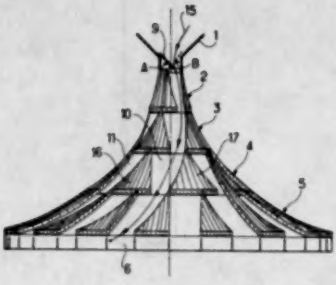
A centrifugal clutch having a driven assembly and a driving assembly including articulated clutch shoe assemblies that are spring biased radially inwardly into a nonclutching position by a coiled garter spring. Each clutch shoe assembly comprises a plurality of independent, generally radially extending segments which are operable to overcome the bias of the spring and to individually engage an inner cylindrical surface of a drum comprising a portion of the driven assembly. The segments are assembled for limited relative movement relative to one another and each segment includes an end surface for substantially conformingly engaging the drum surface. Radial and tangential force components are transmitted through each of the clutch shoe segments, to the driven assembly by driving fingers when the segments move outwardly against the spring bias in response to centrifugal force. By reason of the drum surface conforming nature of the end surfaces of each clutch shoe segment and the provision for relative movement therebetween, each clutch shoe assembly may engage the clutching surface of the driven assembly over substantially the entire clutching surface of the shoe as the individual clutch shoe segments independently move outwardly to engage the mating clutching surface of the drum.

3,640,366
GRAVITY CONVEYOR
John M. Ross, Upland; Warren V. White, Ontario, and Robert P. Wortman, Cucamonga, all of Calif., assignors to Sunkist Growers, Inc., Los Angeles, Calif.
Filed Aug. 4, 1969, Ser. No. 847,017
Int. Cl. B65g 11/10, 11/20
U.S. Cl. 193—7 34 Claims



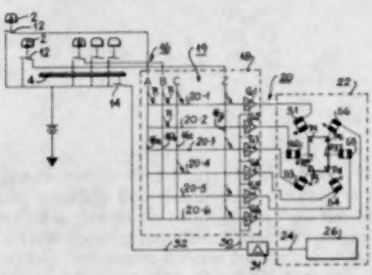
A structure for gravitational conveyance of objects such as citrus fruit from an upper level to a lower level having a plurality of laterally and vertically spaced yieldable barriers staggered at successive levels to repeatedly interrupt the free fall of the objects.

3,640,367
AUTOMATIC SORTING DEVICE
Philippe J. Noetinger, Chilly-Mazarin, France, assignor to Compagnie Generale D'Automatisme, Paris, France
Continuation-in-part of application Ser. No. 707,691, Feb. 23, 1968, now abandoned. This application Feb. 19, 1970, Ser. No. 12,580
Int. Cl. B65g 11/20
U.S. Cl. 193—31 15 Claims



A device for automatically sorting objects, making possible the connection of one input station to one of 2^n output stations, including n−1 superimposed coaxial truncated cones each capable of movement about the axis thereof between first and second specific positions, and one input station equipped with a shutter having two positions. Provided on each truncated cone are troughs or channels delimited by triangular wedges. For a given position of the shutter and each of the truncated cones, there exists one, and only one, track leading from the input station to a selected one of the output stations; thus, the output station is determined on the basis of binary information regulating the positioning of the respective cones and the shutter.

3,640,368
BRAILLE TYPEWRITER
Hershel Weinberger, Jerusalem, Israel, assignor to State of Israel
Filed Aug. 14, 1969, Ser. No. 850,202
Claims priority, application Israel, Aug. 20, 1968, 30578
Int. Cl. B41j 3/32
U.S. Cl. 197—6.1 3 Claims



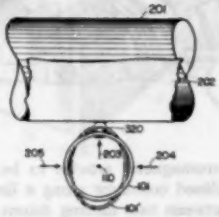
Apparatus for converting a standard typewriter to record in Braille includes a plurality of character-key switches, a Braille recording device, an electrical switching network

between the character-key switches and the recording pin actuators of the Braille recording device, and record sheet advancing means. The electrical switching network includes a diode matrix having an input line for each character key and an output line for each recording pin actuator, and a pulse generator connected to each recording pin actuator. The standard typewriter has a shift-key and one or more double-element keys and therefore the apparatus includes a switch for each of these keys, and a circuit having a pair of AND gates for each of the double-element keys controlling the switching network in accordance with whether or not the shift-key is depressed with a double-element key.

3,640,369
FLEXIBLE SHELL PRINTING ELEMENT

Donald L. Rolph, Fairport, N.Y., assignor to The Singer Company

Filed Apr. 7, 1969, Ser. No. 814,052
Int. Cl. B41j 1/22
U.S. Cl. 197—54 **3 Claims**

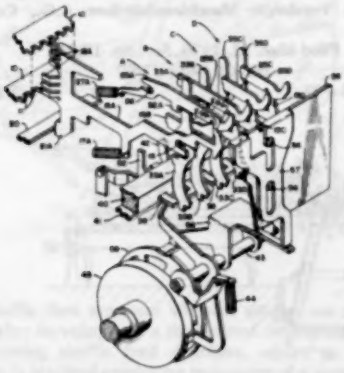


A character supporting type shell for use with a character-by-character printer is disclosed. The shell is constructed of a material and has a shape that cause it to have rotational and longitudinal rigidity when rotated and longitudinally reciprocated about and along an axis, respectively. In addition, the shell has radial resilience so that it is deformable when acted upon by a force in an appropriate direction and of an appropriate magnitude. The resultant structure is one which has a weight considerably less than prior art devices and also a reduced inertia. The last-named factors contribute characteristics which permit a greater printing rate than previously available.

3,640,370
FUNCTION-PERFORMING MECHANISM

Ronald S. Denley, Niles, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Apr. 17, 1967, Ser. No. 631,232
Int. Cl. B41j 19/76
U.S. Cl. 197—114 **8 Claims**

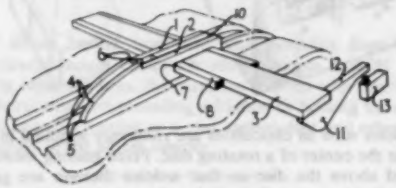


A pair of differently encoded function mechanisms each for operating the line feed mechanism of a printer and a pair of strippers one of which resets one of the function mechanisms after a single line feed operation and the other of which resets the other of the function mechanisms after more than one line feed operation. Similarly, a second pair of differently encoded function mechanisms each for operating the reverse line feed mechanism of the printer which are individually reset by the strippers after single and multiple reverse line feed operations.

3,640,371
CONVEYORS SYSTEMS

Peter J. Jenkins, Sandback, and William C. Neller, Frodsham, both of England, assignors to Dunlop Holdings Limited, London, England

Filed July 28, 1970, Ser. No. 58,913
Claims priority, application Great Britain, Aug. 9, 1969, 39,511/69
Int. Cl. B66b 9/12
U.S. Cl. 198—16 R **4 Claims**

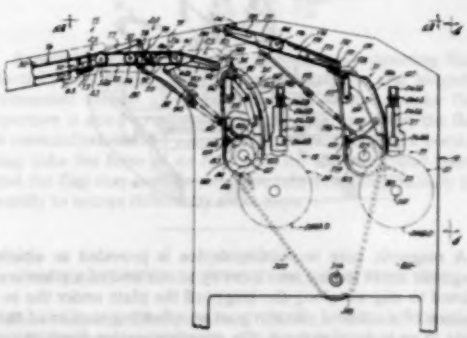


A comb for a conveyor which has a longitudinally grooved load carrying surface. The comb being constructed from a series of rigid teeth resiliently mounted on a rigid transverse support so that the resilient mounting allows the teeth to move to accommodate transverse movement of the conveyor within its guides.

3,640,372
BOOK-TRANSFERRING APPARATUS

Ernest J. Sarring, Fort Thomas, Ky., assignor to Crawley Machinery Co., Newport, Ky.

Original application Jan. 25, 1968, Ser. No. 700,414, now Patent No. 3,494,455, dated Feb. 10, 1970. Divided and this application July 8, 1969, Ser. No. 871,000
Int. Cl. B65g 47/22
U.S. Cl. 198—24 **7 Claims**



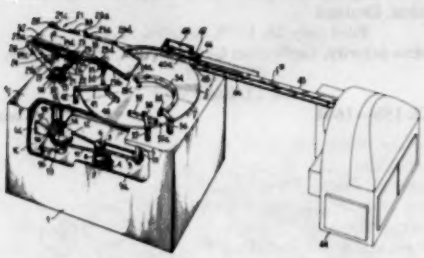
Apparatus for transferring books from a first upper station, to which books are sequentially conveyed horizontally with their backbones leading, alternatively to second and third lower stations at each of which the books are deposited at fixed positions in a vertical disposition with their backbones lowermost, and thereafter advancing the books horizontally from their fixed positions to selectively variable delivery positions.

3,640,373

DEVICE FOR ARRANGING ARTICLES SUPPLIED IN BULK AND INDIVIDUALLY AND SEQUENTIALLY DELIVERING THEM IN ALIGNMENT TO WRAPPING UP MACHINES

Ariosto Seragnoli, Bologna, Italy, assignor to G.D. Societa In Accomandita Semplice Di Enzo Seragnoli E Artosto Seragnoli, Bologna, Italy

Filed Mar. 3, 1970, Ser. No. 16,138
Claims priority, application Italy, Mar. 4, 1969, 1559/A
Int. Cl. B65g 47/26
U.S. Cl. 198—30 7 Claims



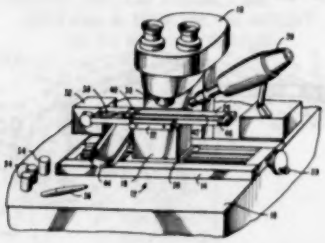
Articles such as chocolates are randomly supplied in bulk to near the center of a rotating disc. Fixed guiding means are located above the disc so that articles thereon are guided outwardly in a generally spiral path so that at the periphery of the disc oriented articles are sequentially and separately delivered to a wrapping-up machine. The guide members have at least one abutment surface angularly inclined to the vertical from the plane of the disc to assist orientation of the articles. Means for turning over articles onto a desired face may be included on the guide members.

3,640,374

MAGNETIC CORE INSPECTION DEVICE

Michael P. Peratis, Newbury Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 19, 1970, Ser. No. 21,096
Int. Cl. B65g 47/24, 47/26
U.S. Cl. 198—30 9 Claims



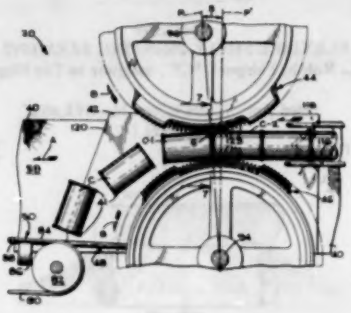
A magnetic core inspection device is provided in which magnetic cores loaded into a cavity at one end of a plate are caused to migrate along the length of the plate under the influence of a coupled vibrator past an orienting section of the plate to an inspection track, the orienting section functioning to arrange the cores in a single row along the inspection track to facilitate inspection of the cores for imperfections using a microscope. The orienting section of the plate includes an elongated element extending between apertures and having a pair of mutually perpendicular, intersecting surfaces forming a track for the cores. The lateral dimensions of the surfaces are respectively less than the overall diameter and thickness of each core, causing excess cores to fall through the apertures and into a catch tray and thereby allowing a single row of cores to migrate onto the inspection track.

3,640,375

HIGH SPEED ARTICLE-TURNING MECHANISM

James L. Reimers, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jan. 9, 1970, Ser. No. 1,652
Int. Cl. B65g 47/24
U.S. Cl. 198—33 AD 18 Claims



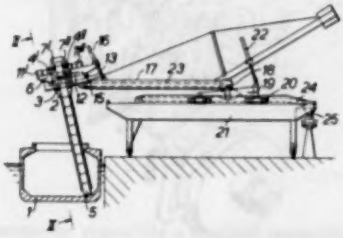
A series of ferromagnetic articles to be turned 90° are moved by an inclined conveyor along a linear path over a deadplate and between two turning drums having resilient peripheral surfaces shaped to conform to the curvature of the contacted surfaces of the articles being turned. One of the drums is driven at a higher speed than the other drum and has its axis of rotation disposed forwardly of a plane which is perpendicular to the linear path and has the axis of rotation of the other drum lying therein thereby providing an angular space or gap between one end of the article being turned and the next following article so that the resilient material on the high-speed drum will enter the space. The discharge edge of the deadplate is angled so as to be parallel to the partially turned articles causing both ends of each article to move off the deadplate onto the conveyor at the same time. A magnetic stabilizing conveyor is positioned to grip one end of each article as the article completes its turn.

3,640,376

UNLOADER FOR BULK MATERIAL IN WHICH A CHAIN BUCKET ELEVATOR CONSTITUTES THE RECEIVING AND ELEVATING APPARATUS

Kurt Peuker, Cologne, and Heinrich Sommer, Porz-Westhofen, both of Germany, assignors to Pohlig-Heckel-Bleichert, Vereinigte Maschinenfabriken A.G., Cologne, Germany

Filed Mar. 12, 1970, Ser. No. 18,847
Int. Cl. B65g 37/00
U.S. Cl. 198—91 3 Claims



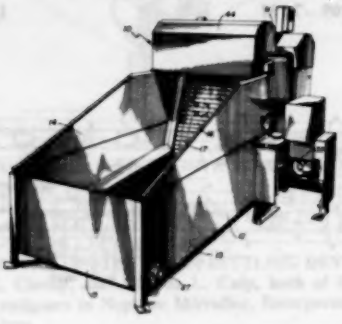
The invention relates to a chain bucket elevator for handling bulk material in the unloading of ships, in which the

bucket elevator is swiveled in the plane of rotation of the buckets and in which the distance between the upper and lower axes of the bucket chain guides remains constant.

3,640,377
RAG FEEDER

Henry F. Benoit, P.O. Box 356, Charlton City, Mass.

Filed Jan. 14, 1970, Ser. No. 2,844
Int. Cl. B65g 17/16
U.S. Cl. 198—178 6 Claims

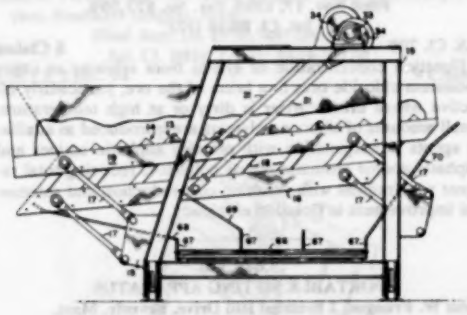


This invention relates to a rag feeder and, more particularly, to apparatus for presenting rags in a flat condition to a shoddy picker.

3,640,378
SHUFFLE FEED MOTION-TRANSMITTING CONNECTION

Melvin R. Elliott, San Jose, Calif., assignor to Genevieve I. Hanscom and Genevieve I. Hanscom, Robert Magnuson and Lois J. Thomson, as Trustees of the estate of Roy M. Magnuson, part interest to each

Filed Apr. 13, 1970, Ser. No. 27,845
Int. Cl. B65g 25/04
U.S. Cl. 198—218 1 Claim

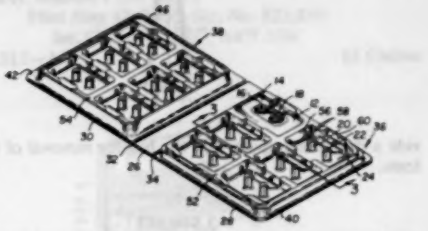


A shuffle feed structure wherein articles are progressed from valley-to-valley over a shuffle feed mechanism involving reciprocating shuffle feed members, where an additional function is involved employing movement of a member of the shuffle feed mechanism which is actuated by the movement of the shuffle feed members but is in a different direction.

3,640,379
CASSETTE ALBUM

Marshall L. Weingarden, 108-18 Queens Boulevard, Forest Hills, N.Y.

Filed Feb. 26, 1970, Ser. No. 14,533
Int. Cl. A45c 11/00; B65d 43/04, 85/67
U.S. Cl. 206—1 R 1 Claim

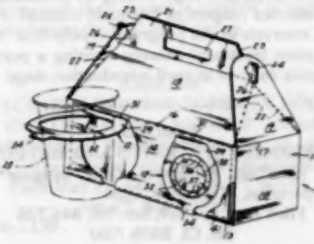


An album having front and back booklike flaps which respectively mount cassette-holding vacuum molded trays. Among other features, the trays are molded with interfitting peripheral structure providing a friction fit holding the album closed and also serving as a seal against dust and other contamination of the album interior.

3,640,380
PORTABLE FOOD AND DRINK CARRIER

William W. Huffman, Wilmette, Ill., assignor to Marketers, Inc., Wilmette, Ill.

Filed Nov. 20, 1969, Ser. No. 878,342
Int. Cl. A45c 11/20; B65d 5/44
U.S. Cl. 206—4 6 Claims



A portable food and drink carrier has cup-supporting flaps partially cut from a sheet-form spine portion and hingedly connected thereto along an upper edge, and a circular flap aperture is sized to supportingly receive a cup when the flap is outwardly folded to a horizontal position. The spin portion may take the form of an enclosure for receiving food items, and the flap may include yieldable tabs extending radially inwardly to accept differently sized cups.

3,640,381
PACKAGE WITH DESTRUCTIBLE PORTION FOR DISPENSING

Takashi Kanada, 28 Shimsaka, 1 Chome, and Toshio Tanaka, 128, Yotsuyakamicho, both of Kawasaki-shi, Japan

Filed July 7, 1969, Ser. No. 839,237
Int. Cl. B65d 75/62, 33/02
U.S. Cl. 206—56 AA 4 Claims

A package comprising a pocket of a stiff material and a flexible bag secured within and to the edges of the pocket. The mouth of the pocket is expanded when the bag is supplied with the package material, to form a support and protective covering for the bag. The bottom of the pocket and

the bag portion connected thereto can be removed from the remainder by separation along a destructible portion to provide a dispensing opening in the bag for removal of the contents.

3,640,382

FLOTATION CONCENTRATION OF MAGNESITE WITH EMULSIFIED COLLECTOR REAGENTS

Tage L. B. Jepsen, Gabbs, Nev., assignor to Basic Incorporated, Cleveland, Ohio

Continuation-in-part of application Ser. No. 743,292, July 9, 1968, now abandoned. This application Feb. 4, 1970, Ser. No. 8,692

Int. Cl. B03b *7/00;* **B03d** *1/02*

U.S. Cl. 209—12 **7 Claims**

Concentration of magnesite present in ores containing siliceous and calcareous impurities and having some clay slimes as impurities by first reducing the slimes content of a magnesite ore pulp, cleaning same in a first flotation treatment wherein some of said impurities are separated as a float product, mixing a selected group of depressants for said siliceous and calcareous impurities in predetermined proportions in a liquid carrier, adding the premixed depressants to the cleaned pulp feed to a second flotation treatment at a predetermined rate, and stage adding an emulsifiable tall oil fatty acid collector reagent of low rosin content in starvation amounts at intervals in the progressive pulp flow through the second flotation treatment thereby floating a portion of the total magnesite content at each introduction stage.

3,640,383

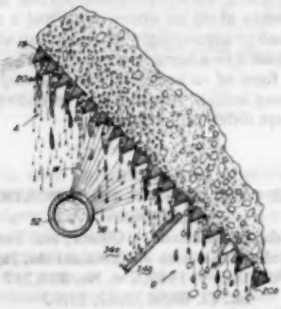
SCREENING APPARATUS AND METHOD

Joseph W. Wantling, Wellington, Ohio, assignor to Wedge Wire Corporation, Wellington, Ohio

Filed Aug. 1, 1969, Ser. No. 846,726

Int. Cl. B03b *7/00*

U.S. Cl. 209—17 **15 Claims**



Water is sprayed toward an aggregate through the underside of a sloping screen at spaced intervals along its length. The gaps in the screen are of a constant width for separating the aggregate into two particle groups, an undersize group and an oversize group. In another embodiment, the gaps in the screen increase toward the discharge end for separating or sizing the aggregate into several different particle groups. In both embodiments, a portion of the undesired lightweight particles, such as clay, normally collected with the undersize particles overflows the screen with the oversize particles.

3,640,384

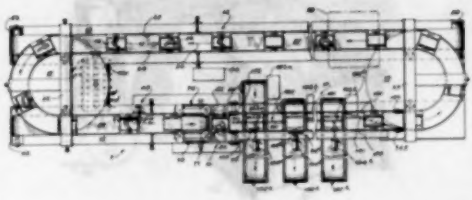
APPARATUS FOR WEIGHT-CLASSIFYING ODD-SHAPED ARTICLES

Victor Del Rosso, Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed July 10, 1969, Ser. No. 840,669

Int. Cl. B07c *5/28*

U.S. Cl. 209—74 M **13 Claims**



An apparatus for weight-classifying odd-shaped articles, wherein a plurality of open-topped carrier buckets having hinged bottoms adapted when closed to support articles thereon are continuously passed sequentially through a filling station at which articles are positioned in the buckets, a weighing station at which the articles are weighed, and a discharge classifying station at which the bottom of each bucket is opened to discharge an article into one of a plurality of article takeoff conveyors on the basis of its previously recorded weight.

3,640,385

REAGENTS FOR BENEFICIATING ORES

Randal E. Smith, and Clarence W. Egbom, both of Carlsbad, N. Mex., assignors to Ideal Basic Industries, Inc., Carlsbad, N. Mex.

Filed Nov. 17, 1969, Ser. No. 877,509

Int. Cl. B03d *1/02*

U.S. Cl. 209—166 **8 Claims**

Flotation concentration of sylvite from sylvinite or other potassium chloride ores in a brine of the ore, particularly effective where brine carrier is dirty or at high temperature. Small amounts of silicone polymers are introduced as auxiliary agents in conjunction with primary aliphatic amines and aliphatic and/or aromatic oils as collectors reducing total reagent requirement with resulting cost reduction and substantial improvement in flotation efficiency.

3,640,386

PORTABLE SIFTING APPARATUS

John W. Frangos, 2 Brimbal Hill Drive, Beverly, Mass.

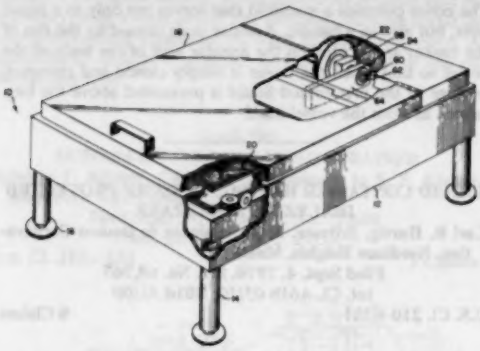
Filed June 2, 1969, Ser. No. 848,373

Int. Cl. B07b *1/28*

U.S. Cl. 209—337 **2 Claims**

A compact, portable, power-driven sifter is provided for use in sifting flour or the like, and is particularly suited for restaurant and institutional use. A basket having replaceable screens is mounted in a housing for horizontal oscillatory movement by means of a motor-driven eccentric linkage, the basket being supported on rollers and guided by sheave rolls

against lateral displacement. The housing is supported in a highly raised position by elongated legs to permit pans, trays



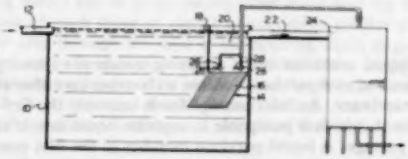
and the like to be moved in and out from under the unit from any side thereof.

3,640,387

REMOVAL OF FLOC FROM SETTLING DEVICE

Walter R. Conley, and Gordon L. Culp, both of Corvallis, Oreg., assignors to Neptune Microfloc, Incorporated, Corvallis, Oreg.

Filed Dec. 15, 1969, Ser. No. 884,908
Int. Cl. B01d *21/02*
U.S. Cl. 210—73 **4 Claims**



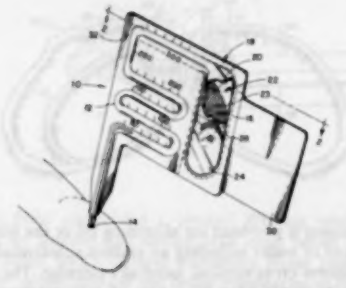
Floc buildup on top edges of inclined tube settling device prevented by causing slight flow of liquid across tops of tubes.

3,640,388

DIALYZING LIQUID-COLLECTING CONTAINER

Andres Ferrari, Dover, Mass., assignor to Damon Corporation, Needham Heights, Mass.

Filed Aug. 20, 1970, Ser. No. 65,540
Int. Cl. B01d *31/00;* **A61b** *05/10*
U.S. Cl. 210—94 **9 Claims**



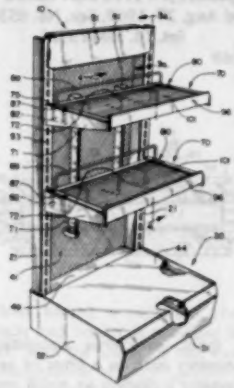
A liquid container, pumpable to aspirate liquid into it via an inlet passage, has a dialyzing membrane forming first and second compartments within the container on either side of the membrane. The inlet passage feeds into only one of the two compartments and that one compartment, at least, includes pumpable walls of the container.

3,640,389

DISPLAY STAND AND EXPENDABLE SHELF FOR USE THEREON

Alan K. Snyder, River Forest, Ill., assignor to Chicago Display Company, Melrose Park, Ill.

Filed May 12, 1969, Ser. No. 823,835
Int. Cl. A47b *96/02;* **A47f** *5/00*
U.S. Cl. 211—148 **15 Claims**



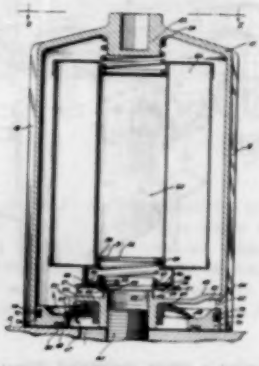
A display stand comprising a four-sided base and a pair of upright shelf support means wherein the base is slidably assembled, and an extendable shelf for use on the display stand comprising a first shelf means, and a second shelf means wherein the second shelf means is capable of vertical movement with respect to the first shelf means.

3,640,390

REPLACEABLE CARTRIDGE FILTER HOUSING

Thomas J. Goy, Canoga Park; Richard P. Knieriemen, Van Nuys, and James E. Reading, Sepulveda, all of Calif., assignors to Torite Enterprises, Inc., San Fernando, Calif.

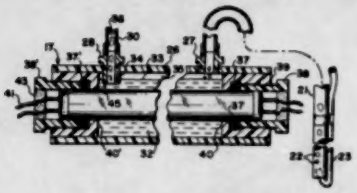
Filed May 13, 1968, Ser. No. 728,674
Int. Cl. B01d *27/08*
U.S. Cl. 210—130 **13 Claims**



A replaceable cartridge is provided for a screw-on-type oil filter useful in automobile engines, or the like. A floating cartridge is provided which is spring loaded against the bottom

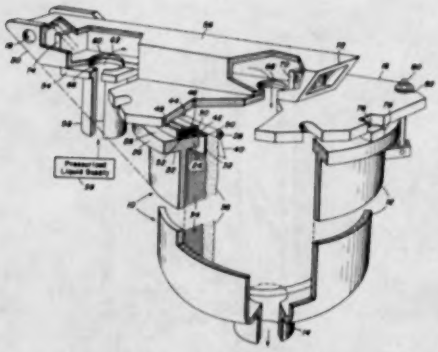
of a housing and held in place by spider-type clamping arrangement which is easily removable for the changing of the filter therein. There is also provided an antidrainback valve which is constructed of a single piece and prevents oil from draining back into the oil system when oil is not being pumped through the filter. The filter housing is provided with a plurality of coolant fins which permits the oil to be cooled as it is being pumped through the filter system.

3,640,391
AQUARIUM ACCESSORIES WITH SELF-STARTING WATER-CIRCULATING SYSTEMS
Paul David Carpenter, Jr., 1112 Burr Street, Algonquin, Ill.
Filed Aug. 27, 1969, Ser. No. 853,388
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **9 Claims**



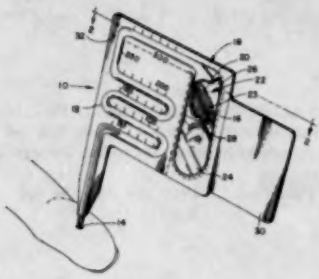
Self-starting, quiet, surge-free circulation of aquarium water to an accessory such as a filter or germicidal lamp is achieved by a system including an airlift into a substantially airtight accessory where the air and water are trapped so as to provide a pressure to lift the water out of the accessory. Air other than the quantity remaining trapped is bled through a constricted passage into the outflowing water tube, and appears to aid its outflow by a blowing action resembling an airlift.

3,640,392
PRESSURIZED LIQUID-FILTERING APPARATUS
Edward A. Smith, Glenville, and Arnold V. Baldwin, Wilton, both of Conn., assignors to GAF Corporation, New York, N.Y.
Filed May 19, 1970, Ser. No. 38,784
Int. Cl. B01d *29/10*
U.S. Cl. 210—232 **13 Claims**



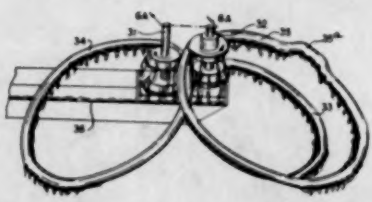
A vessel having a cover connected thereto by a unique hinge contains a basket supported filter bag for filtering liquid under pressure that enters the mouth of the bag through an inlet in the cover and is discharged through an outlet in the bottom of the vessel. The hinge is provided with a liquid inlet passage which communicates with a liquid supply plumbing connection which is permanent and need not be disturbed when the cover is arriving open, or closed. The cover contains a manifold that serves not only as a liquid inlet, but also as a handle. Annular seals caused by the rim of the basket are located on the annular wall of the body of the vessel so that when the cover is simply closed and clamped, leakage of the pressurized liquid is prevented above the bag, as well as from the vessel itself.

3,640,393
LIQUID CONTAINER HAVING PRESSURE-PROTECTED DIALYZING MEMBRANE
Carl R. Hurtig, Scituate, Mass., assignor to Damon Corporation, Needham Heights, Mass.
Filed Sept. 4, 1970, Ser. No. 69,767
Int. Cl. A61b *05/10;* **B01d** *31/00*
U.S. Cl. 210—321 **8 Claims**



A liquid container has a dialyzing membrane forming first and second compartments within a chamber on either side of the membrane. An inlet passage feeds into only the first compartment, which is pumpable to aspirate liquid into it via the inlet passage. A liquid-pervious member in the first compartment backs up the membrane to support it when there is a greater pressure in the second compartment than in the first.

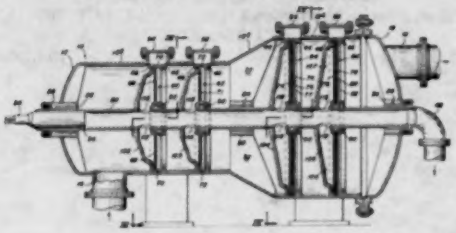
3,640,394
OIL SKIMMER WITH OSCILLATABLE CIRCULAR LOOP
Eugene L. Brill, and Beatrice M. Brill, both of 1803 West Royalton Road, Cleveland, Ohio
Filed May 25, 1970, Ser. No. 40,228
Int. Cl. E02b *15/04;* **B01d** *17/02*
U.S. Cl. 210—322 **15 Claims**



An apparatus is provided for skimming oil or the like floating on a pool of water including an endless substantially rigid loop of uniform cross section, generally circular. The loop is gripped at its upper edge by a pair of rolls rotating in opposite directions and drivingly engaging said loop at one zone in diagonally opposed quadrants, one above and one below the center of a section of the loop. The rolls rotate the loop in its own plane causing it to pass continuously into and out

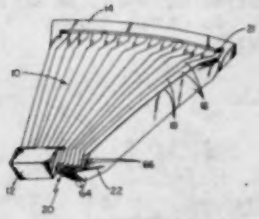
of the pool of water or hydrophilic liquid and to attract hydrophobic material, such as oil or the like or finely divided or colloidal material, which material is lifted by the coil and squeezed out upon passing through the rolls or separated by a scraper or by a blast of air. The loop may oscillate about an axis substantially tangential the loop at the driving zone. A modification utilizes a brushlike surface on the loop and on the driving rolls.

3,640,395
AUTOMATIC SELF-CLEANING STRAINER
Selwyne P. Kinney, Carnegie, Pa., assignor to S. P. Kinney Engineers, Inc., Carnegie, Pa.
Filed Sept. 14, 1970, Ser. No. 71,680
Int. Cl. B01d *35/12, 29/38*
U.S. Cl. 210—334 **7 Claims**



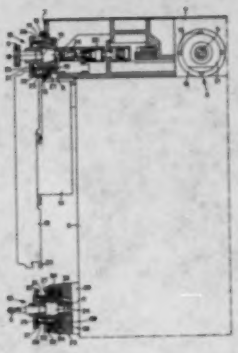
An automatic self-cleaning strainer having multiple stages of straining within a single housing. Straining media are spaced in the housing along the liquid flow stream. The straining media are of progressively finer mesh and the free flow area of each stage of media is preferably greater than the flow area through the inlet of the housing. Each stage of straining media is provided with a backwash shoe engaging the upstream surfaces of the media. Each backwash shoe is coupled to a common manifold shaft which receives the backwash liquid and discharges it outside of the housing.

3,640,396
FILTER
Peter Brownell, Providence, R.I., assignor to Fram Corporation, Providence, R.I.
Filed Apr. 3, 1970, Ser. No. 25,470
Int. Cl. B01d *27/06*
U.S. Cl. 210—493 **1 Claim**



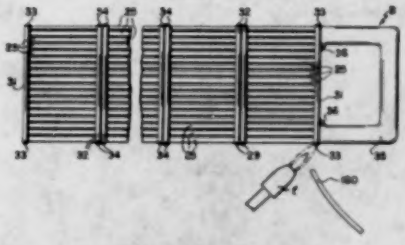
A fluid filter comprising a pleated filtering medium arranged in an annulus and having axial main pleats (defined by radial score lines), oblique secondary pleats (defined by "sawtooth" score lines) at the radial peripheries of the annulus, and seals around the peripheries which overlap at least a portion of the oblique pleats; the filter tapering at the oblique pleats to an axial dimension less than a corresponding axial dimension of the main pleats.

3,640,397
TOOLHOLDER FOR MACHINE TOOLS
Giorgio Ollearo, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Turin, Italy
Filed Dec. 31, 1969, Ser. No. 889,571
Claims priority, application Italy, Jan. 28, 1969, 50322 A/69
Int. Cl. A47f *3/08*
U.S. Cl. 211—1.5 **3 Claims**



In a machine tool having a rotatable chuck and tool magazine drum, each tool holder is provided with a protective tube concentric with the shank of the tool holder. The chuck and each compartment of the magazine drum are provided with an annular recess. The tube is housed in the recess when the toolholder is placed in the compartment or chuck housing, creating a labyrinth which prevents the shank from dirtying during operation. The recess of the chick is also provided with packing, sealing the tube and the recess.

3,640,398
WAFER BOAT
Ted A. Loxley, Mentor; John M. Webb, Chagrin Falls, and Walter G. Barber, North Perry, all of Ohio, assignors to Edward J. Mellen, Jr., Cleveland, Ohio
Filed Mar. 30, 1970, Ser. No. 23,680
Int. Cl. H01l *7/00;* **B05c** *11/14*
U.S. Cl. 211—41 **19 Claims**



A quartz-glass carrier frame for supporting a series of rows of silicon wafers made by clamping a single row of flat quartz-glass rods together with rows of shims having a thickness substantially equal to the wafer thickness, welding the rods together at spaced locations along their length, and welding lateral quartz-glass spacer rods to the longitudinal rods and to a flat bottom plate.

ERRATUM

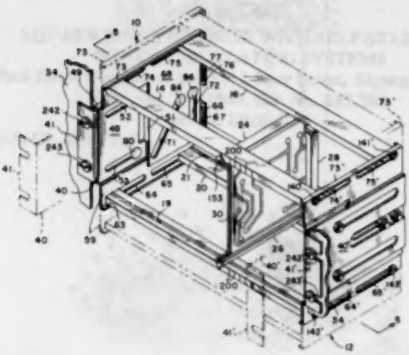
For Class 211—148 see:
Patent No. 3,640,389

3,640,399

PRINTED CIRCUIT CARD RACK

John H. Hartman, Bedford, Tex., assignor to Thermalloy Incorporated, Dallas, Tex.

Filed Mar. 12, 1970, Ser. No. 18,893
Int. Cl. A47f 5/10
U.S. Cl. 211—175 11 Claims



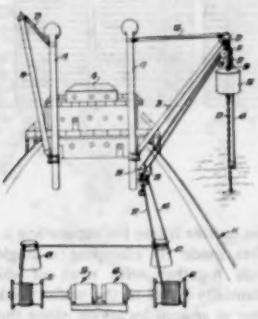
A printed circuit card rack is described having a pair of spaced-apart end assemblies between which a plurality of channel members are connected that support circuit card guides. Connectors are supported by the channel members in alignment with the guides. The end assemblies each comprise a plurality of members that permit selectively changing the distance of separation between selected channel members, so that printed circuit cards of different widths can be accommodated. The end assemblies also include members for attaching the rack to a panel, in which these members are selectively adjustable relative to the other end members, so that printed circuit cards of different depths can be accommodated.

3,640,400

SYSTEM AND METHOD FOR HOISTING SUBMARINE HOSE

Donald E. Becraft, Pacifica, Calif., assignor to C. J. Hendry Company, San Francisco, Calif.

Filed Dec. 9, 1970, Ser. No. 96,502
Int. Cl. B66c 23/52
U.S. Cl. 212—3 4 Claims



A system and method to be used on a ship moored offshore to hoist submarine hoses from the floor of the ocean to the deck of the vessel. The system and method employs utilization of two cables or falls, the first of which is first attached to a buoy connected to the submarine hose by a chain and then raised as high as possible. The second fall is then attached as low as possible to the chain and it too is hoisted as high as possible within the limits of the boom used. The buoy on the first fall is then lowered to the deck of the vessel and the first fall is then attached low on the chain and hoisted as high as possible. By alternately attaching the first and second falls as low as possible to the chain and hoisting them as high as possible the hose attached to the bottom of the chain is eventually brought to the surface and onto the deck of the vessel.

3,640,401

TRANSPORTABLE TOWER CRANE FOR RAPID ERECTION

Pierre Joseph Pingon, 7 Avenue du Parmelan, 74 Annecy, France

Filed Jan. 11, 1971, Ser. No. 105,350
Claims priority, application France, Jan. 14, 1970, 7001162
Int. Cl. B66c 23/72
U.S. Cl. 212—49 10 Claims

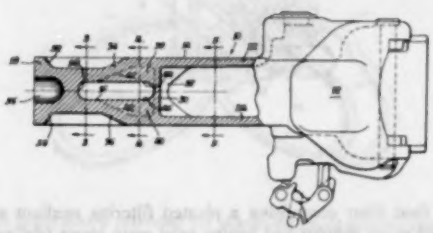
A transportable tower crane for rapid erection comprising a lower frame, an upper rotating frame carrying a mast comprising one or several parts and a foldable jib. A ballast is secured on a frame which is pivoted on the rotatable frame of the crane about a vertical axis but which can be immobilized in the rotational direction relatively to this rotating frame. Coupling means are fixed or may be fixed on the lower frame and are so arranged that it can be pivotally connected to a tractor vehicle about a vertical axis coincident with the vertical pivotal axis of the ballast-carrying frame. This arrangement enables transportation of the crane without dismantling the ballast, which rests about the platform of the tractor vehicle. When curves are negotiated during transportation the assembly pivots around the aforesaid pivotal axis.

3,640,402

INTERNALLY REINFORCED SHANK FOR A RAILWAY COUPLER

Russell G. Altherr; Paul F. Shramovich, and Nelson D. Metzger, all of Chicago, Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

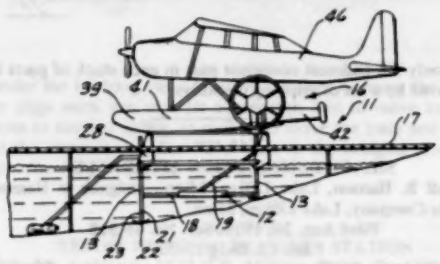
Filed Nov. 10, 1969, Ser. No. 875,207
Int. Cl. B61g 7/10, 9/00
U.S. Cl. 213—62 10 Claims



The key slot of a railway coupler shank is modified to distribute tensile forces to the top, bottom and sidewalls of the shank. Upper and lower straps angle away from the key bearing wall of the key slot and into the top and bottom walls of the shank providing openings above and below the key slot thereby lightening the shank and improving the containment

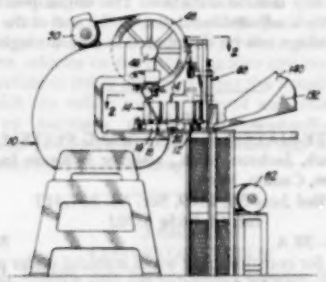
of the key slot core for more effective manufacturing. An upper and a lower support rib in each opening is respectively connected to the top wall and the upper strap and the bottom wall and the lower strap to properly locate the key in the key slot.

3,640,403
FLOAT PLANE HOIST
Byron L. Godbersen, 710 Circle Drive, Ida Grove, Iowa
Filed July 27, 1970, Ser. No. 58,328
Int. Cl. B66f 7/06
U.S. Cl. 214—1 A **4 Claims**



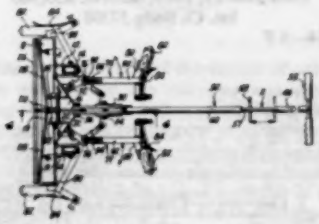
A float plane hoist is provided herein comprising, in combination, a frame having spaced-apart, upstanding legs, a pontoon support means which is movable upwardly and downwardly relative to the frame and a foldable winch for moving the pontoon support means upwardly and downwardly. The winch is foldable to provide clearance for the elevators of the float plane when the float plane is being loaded and unloaded from the pontoon support means.

3,640,404
PRODUCTION ASSEMBLY MECHANISM FOR TELESCOPICALLY ASSEMBLED AND INTERFERENCE FORMED PARTS INCLUDING TRANSFER ARM MECHANISM
Adolf Schoepe, 1620 North Raymond Avenue, Fullerton, Calif., and Fredric E. Schmuck, 535 Century Drive, Anaheim, Calif.
Original application Aug. 22, 1969, Ser. No. 852,316, now Patent No. 3,606,661, dated Sept. 21, 1971. Divided and this application Oct. 30, 1970, Ser. No. 85,674
Int. Cl. B66c 1/54
U.S. Cl. 214—1 BB **6 Claims**



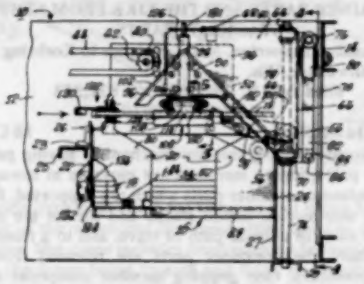
A series of spaced fixtures are mounted on a rotatable indexing table progressively movable between first and second and third assembly stations and a fourth pickoff station so that production parts, such as three parts of a ball cock lower assembly, may be received at the first assembly station in an initially telescoped condition, formed into an intermediate telescoped condition at the second assembly station by an intermediate assembly ram, formed into a final telescoped and interengaged condition at the third assembly station by a final assembly ram and automatically removed from the indexing table at the fourth pickoff station by a pickoff mechanism. The fixtures include resiliently urged pivotal holding fingers maintaining proper part alignment and permitting the various telescoping and reforming operations, while the intermediate and final assembly rams operate together, one preferably being mounted directly on the other. The pickoff mechanism includes a cam controlled, vertically and horizontally movable arm having releasable pickup means thereon automatically engaging and retaining finally assembled parts at the forth pickoff station and removing the parts both vertically and horizontally to a location remote from the indexing table.

3,640,405
SLIP PALLET LIFTER
Harry M. Carpenter, Jr., 404 Brookside Court, Augusta, Ga.
Filed Apr. 1, 1970, Ser. No. 24,741
Int. Cl. B62b 1/06
U.S. Cl. 214—1 B **6 Claims**



A pair of jaws extend laterally at the front of the lifter and are manually closable to grip the edge of a slip pallet. The lifter is then tilted about supporting wheels close to the jaws to lift one edge of the pallet and load and arms on the lifter are swung forwardly to position blocks under the load. The blocks are releasably held by the arms so the load can be lowered onto the blocks and the lifter withdrawn to leave one edge of the slip pallet and load elevated for reception of the fingers of a forklift truck.

3,640,406
LOWERING DEVICE
Gunter E. Becker, Manhattan Beach, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 31, 1970, Ser. No. 68,083
Int. Cl. B65g 57/112, 60/00
U.S. Cl. 214—6 G **20 Claims**



A device for lowering a flat member from a first, upper level to a second, lower level in a storage magazine including

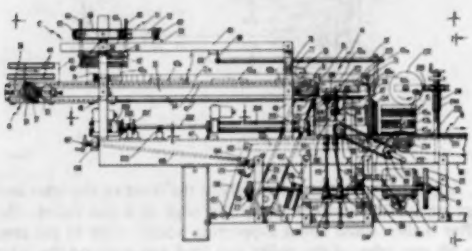
a pair of opposed vertical side plates, each of which supports an inverted V-shaped cam and means facing inwardly of the side plates for receiving and supporting an essentially flat member thereon. Cam followers, associated with means for positioning a flat member on the opposed support means, cause vertical movement of the lowering device as they ride over the upwardly inclined surfaces of the inverted V-shaped cams, prior to reaching the apex of each cam, whereby the flat member is lowered in a planar vertical fashion. As the cam followers move over the downwardly sloping legs of the inverted V-shaped cams, the lowering device is returned, under the action of upwardly biasing spring means, to its initial position. The specific structure of the opposed support means enables the flat member to be gently deposited on a support in the lower level and permits the lowering device to be smoothly returned to its initial position without interference from other flat members stored in the magazine.

3,640,407

APPARATUS FOR HANDLING BOOKS

Frank J. Anastasio, Paramus; Clinton F. Brundage, Mahwah, both of N.J., and Clarence P. Strakosch, Tappan, N.Y., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed June 17, 1969, Ser. No. 833,985
Int. Cl. B65g *57/08*
U.S. Cl. 214—6 F **20 Claims**



Method and apparatus whereby books delivered on-edge, spine-up, as by a building-in machine, are alternately tipped in opposite directions on a continuously operating belt conveyor, funneled into alignment and then stacked with the spine joints of adjacent books at opposite sides of the stack and offset to prevent crushing thereof. The progressively formed stacks are progressively lowered on a photocell-controlled elevator, jogged, and then removed to a delivery conveyor while the building of the succeeding stack is begun on an auxiliary retractable platform for subsequent transfer to the elevator.

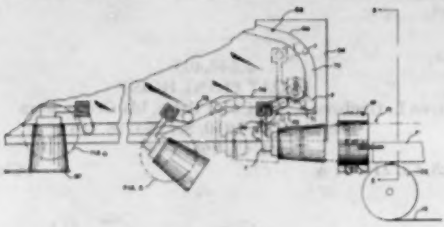
3,640,408

PART-REMOVING MECHANISM FOR REMOVING CONTAINER PARTS AND THE LIKE FROM NESTED STACKS OF PARTS

Gary A. Adams, Beaverton, Mich., assignor to Koehring Company, Milwaukee, Wis.

Filed June 9, 1969, Ser. No. 831,552
Int. Cl. B65g *59/10*
U.S. Cl. 214—8.5 A **18 Claims**

Continuously moving transfer mechanism having pairs of container part-gripping members are movable in toward the ends of endmost container parts which are supported, for example, in side-by-side nested stacks and thence are moved endwisely away in a linear path of travel and to a remote location where the container parts are released from the gripping members. One gripping member comprises a plug which is shaped to enter a container part having a radially inwardly extending lip and each plug has a rib for engaging behind the lip of the container part to pull the container part outwardly. The other container-gripping part comprises a suction cup. Restraining members are provided for insuring



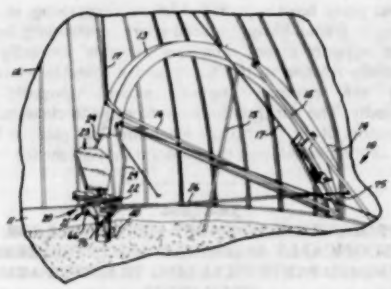
that only the endmost container part in each stack of parts is removed by a set of gripping members.

3,640,409

SILAGE DISTRIBUTION APPARATUS

Newell B. Hanson, Lake Lillian, Minn., assignor to Hanson Silo Company, Lake Lillian, Minn.

Filed Aug. 20, 1970, Ser. No. 65,518
Int. Cl. B65g *65/32*
U.S. Cl. 214—17 CB **3 Claims**



A frame pendulously attachable to the outlet end of a blower pipe or silage chute within a silo including a motor and gear box with a clutch arrangement therein so that a first generally horizontal plate is attachable to the motor for continuous rotation during energization of the motor and a second angularly disposed plate or deflection plate mounted above the generally horizontal plate for rotation during actuation of the clutch arrangement so that silage leaving the blower pipe is deflected onto the generally horizontal plate in substantially any desired direction. The entire pendulously mounted frame is adjustable relative to the end of the blower pipe so that silage can be distributed evenly throughout the entire silo.

3,640,410

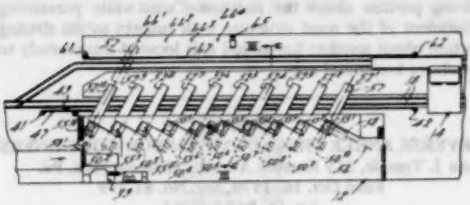
WASTE-MATERIALS-HANDLING SYSTEM

Robert J. Pioch, Jackson, Mich., assignor to Kysor Industrial Corporation, Cadilla, Mich.

Filed June 30, 1969, Ser. No. 837,417
Int. Cl. B65g *67/02*
U.S. Cl. 214—38 A **8 Claims**

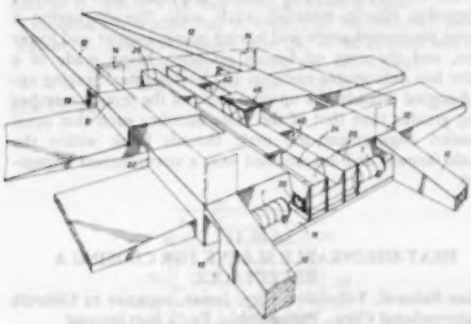
Apparatus for containerizing waste material under pressure in vans for hauling on railcars of the type having elevatable turntable-type van supports, and for loading and unloading the vans relatively to the railcars, includes a plurality of compactors spaced along and beside a rail siding on a raised platform. Another platform of the same height is on the opposite side of the siding track. The compactors work transversely of the track. The height of the platforms conforms to a raised position of the turntables so that each van can be turned,

when its turntable is raised, to a position such that the two ends of the van overlie the platforms. When the turntables are lowered the vans rest transversely on the platforms in bridging relation thereto, and the train is movable freely



under the bridging vans. Winches are used to move the train to align each van with its compactor, and to move loaded vans to another siding, as well as to move the train and vans at the disposal site. The vans when in the bridging position are closer together than when on the train.

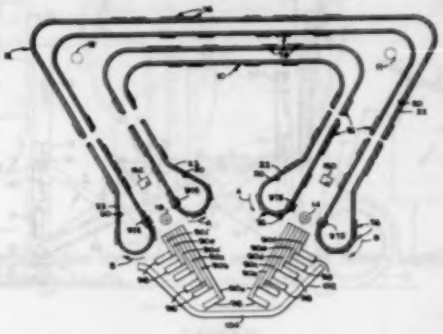
3,640,411
REFUSE DISPOSAL TRANSFER STATION
Orin M. Anderson, 1123 S.E. Military Drive, San Antonio, Tex.
Filed Mar. 23, 1970, Ser. No. 21,783
Int. Cl. B65g *67/04*
U.S. Cl. 214—41 **8 Claims**



A transfer station for the unloading of refuse from collection vehicles and the loading of the refuse into transfer vehicles for transportation to a final disposal location. The station has an unloading area at an upper level and a transfer vehicle loading area at a lower level, and the unloading area has open troughs positioned to receive refuse discharged from collection vehicles on the unloading area and means for moving the refuse in either direction along the troughs to hoppers into which the refuse may be moved and which are positioned to discharge the refuse downwardly into ram mechanism positioned to load the refuse into transfer vehicles located in the loading area.

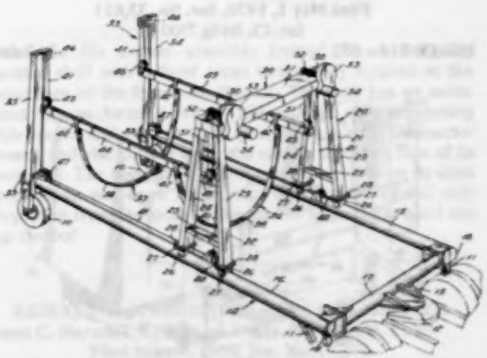
3,640,412
CONVEYOR SYSTEM
Robert J. Traube, San Mateo, Calif., assignor to FMC Corporation, San Jose, Calif.
Original application Aug. 21, 1968, Ser. No. 754,443. Divided and this application Nov. 17, 1969, Ser. No. 871,299
Int. Cl. B65g *37/00*
U.S. Cl. 214—152 **5 Claims**

A storage and retrieval system for goods has two power-operated conveyors movable in separate endless loops past two (or more) spaced-apart picking stations, each picking station common to both conveyors. Each conveyor has bins with compartments in which goods are stored. Although the bins on each conveyor remain in the same sequence, the bins are movable relative to each other on the conveyor to define "buffer" zones which permit simultaneous picking by two spaced-apart pickers. The control system for the conveyors includes a reader which receives digital data concerning a group of orders to be picked from a stack of cards, each card



giving the identity, quantity, and distribution of one of the articles to be picked. The two conveyors are automatically stopped alternately with the bins containing ordered goods at the picking stations, and the operator at each picking station picks goods from the bins in accordance with a readout unit which displays the card data. A plurality of packing lanes originate at each picking station and terminate at a plurality of packing stations. Each picker distributes goods to the separate packing lanes in accordance with the readout unit at the picking station.

3,640,413
BOAT CRANE
Carl Robert Klein, 403 Northwest Street, Bellevue, Ohio
Filed Dec. 29, 1969, Ser. No. 888,776
Int. Cl. B60p *3/10*
U.S. Cl. 214—396 **5 Claims**



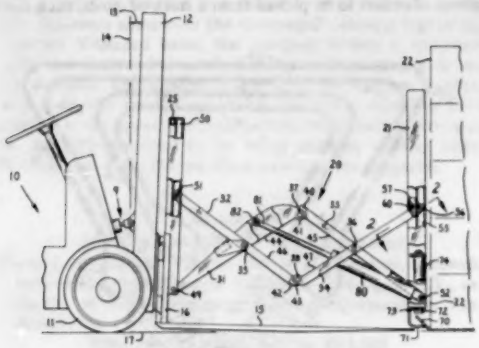
Straddle-type boat crane for lowering and lifting boats into and out of the water and for transporting them to and from the water. The crane includes fixed position forward and rear hoists, the latter being free of any fixed or movable transverse member and providing unlimited inside clear height at all times for ease and convenience in handling boats having high superstructures or tall spars.

3,640,414

PUSH-PULL ATTACHMENT FOR LIFT TRUCKS

Ronald A. Brudi, Longview, Wash., assignor to Brudi Equipment, Inc., Longview, Wash.

Filed Mar. 2, 1970, Ser. No. 15,385
Int. Cl. B60p *1/02*
U.S. Cl. 214—514 **6 Claims**



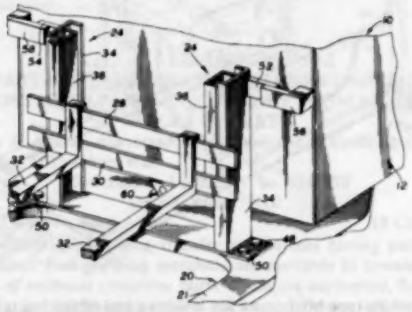
A novel lazy tongs has offset pivotal connections between the arms of the linkage allowing the arms to fold together compactly in vertical positions. The lazy tongs linkage actuates a push frame for pushing a load off the forks of the lift truck. An adjustable length connection between the upper forward arm and the push frame allows the upper end of the push frame to be tilted backward in extended position of the linkage so that the thrust may be applied principally at the bottom of the load. Since the adjustable length arm is vertical in retracted position, the push frame is always vertical in retracted position regardless of its tilt in extended position. The rearward tilt of the push frame in extended position is also advantageous in grasping sheetlike pallets to pull a pallet load onto the forks of the truck. The lower edge of the push frame may be equipped with pallet grippers for this purpose.

3,640,415

INDUSTRIAL VEHICLE

James A. Wahl, Langhorne, and Robert A. Nieminski, Philadelphia, both of Pa., assignors to Eaton Yale & Towne, Inc., Cleveland, Ohio

Filed May 1, 1970, Ser. No. 33,611
Int. Cl. B65g *7/00*
U.S. Cl. 214—672 **3 Claims**



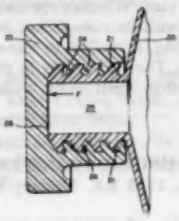
An industrial lift vehicle includes a driving portion and a load lifting portion. The load lifting portion includes a ground engaging outrigger which is pivotally connected to the driving portion about a horizontal axis. The load lifting portion includes a vertically extending mast structure mounted on the outrigger for pivotal movement therewith with respect to the driving portion. Means are provided on the driving portion and the mast structure for permitting articulation of the load mast and outrigger with respect to the driving portion about the horizontal axis while preventing movement of the mast structure with respect to the driving portion about another horizontal axis located transversely to the above horizontal axis.

3,640,416

REVERSE ANGLE THREAD SYSTEM FOR CONTAINERS

John J. Temple, 255 Kossuth Avenue, Milmont Park, Pa.

Filed Oct. 16, 1970, Ser. No. 81,279
Int. Cl. B65d *41/04*
U.S. Cl. 215—43 **7 Claims**



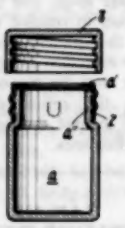
In a container for holding fluids having a neck portion through which the fluid is poured and a head portion, or cap which threadedly engages the neck portion, a thread system wherein the neck, or male threads are made of a relatively deformable plastic material, such male threads having a reverse downward angle and having parallel upper and lower edges, and the cap, or female member, being made of a harder less deformable material and having interengaging upward angled threads, the upward angle of the female member being greater than that of the male member such that upon threaded engagement the male threads hook within the female threads and are stressed into a strengthened engagement.

3,640,417

HEAT-SHRINKABLE SLEEVE FOR CLOSING A RECEPTACLE

Masao Sakurai, Yokohama City, Japan, assignor to Gilbreth International Corp., Philadelphia, Pa., a part interest

Filed Mar. 12, 1970, Ser. No. 11,762
Int. Cl. B65d *55/02*
U.S. Cl. 215—83 **7 Claims**



A closure for container which permits, when on display, the customer to look into and smell the products packaged therein and nevertheless prohibits him to touch the products directly with a finger. The container is sealed at its mouth portion by a flat, porous top member and has provided at the outer periphery of the container a U-shaped tongue for use in removing the entire closure when the container is to be opened.

3,640,418
THROWAWAY CLOSURE FOR TEST TUBE

Robert J. Williams, Dover, Ohio, assignor to Dover Molded Products Company, Dover, Ohio

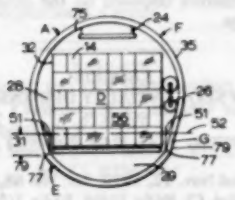
Filed Apr. 6, 1970, Ser. No. 25,888
Int. Cl. B65d *41/22, 39/00*
U.S. Cl. 215—41 1 Claim

A disposable plastic closure cap for test tubes dimensioned to fit loosely over the exterior of the open end of a test tube, the cap having an annular plug extending down from the top of the cap to fit into the test tube snugly but not airtightly, the plug surface being in the form of two truncated cones having a common base and different conical angles.

3,640,419
APPARATUS FOR EXPANDING A CYLINDRICAL VACUUM COOLING CHAMBER

George W. Baker, P.O. Box 1756, El Centro, Calif.

Original application July 9, 1968, Ser. No. 743,447, now Patent No. 3,543,369, dated Nov. 24, 1970. Divided and this application July 20, 1970, Ser. No. 63,965
Int. Cl. B65d *7/04, 7/38, 7/44*
U.S. Cl. 220—5 A 3 Claims



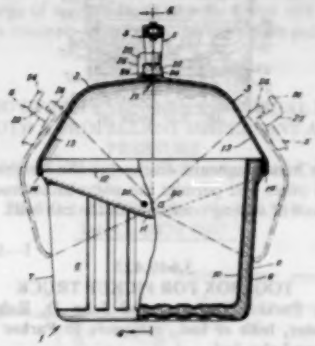
A method for converting and an apparatus comprising a cylindrical vacuum cooling chamber having an eccentric and increased overhead dimension. The cylinder as expanded provides substantially the strength of a cylindrical shell without elastic deformation of the cylinder or extensive piping reconnection during the expansion process.

3,640,420
COOLER CHEST

William R. Carter; Charles Jay Slaybaugh, both of Dallas, Tex., and Patrick M. Hodgins, Holdenville, Okla., assignors to Edward Kelley Corporation, Houston, Tex.

Filed Dec. 19, 1969, Ser. No. 886,545
Int. Cl. B65d *25/18*
U.S. Cl. 220—9 R 6 Claims

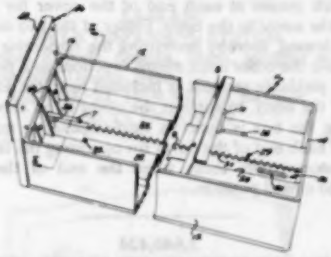
The cover of a portable, thermally insulated container consists of two identical parts which dovetail together and engage the container to seal it shut. Each cover part is pivoted at its ends to the container to swing outwardly away from each other to give full access to the container. A carrying handle also consists of two identical parts, each pivotally mounted upon a cover half to draw and lock these parts together when the two handle members are drawn together to form the handle.



3,640,421
DRAWER CONSTRUCTION FOR CARD FILES AND THE LIKE

Edward M. Conway, and Daniel E. Conway, both of Grand Rapids, Mich., assignors to Conway-Cleveland Corporation, Grand Rapids, Mich.

Filed June 12, 1969, Ser. No. 832,563
Int. Cl. B65d *1/24, 1/36, 7/42*
U.S. Cl. 220—22.3 13 Claims



A card file drawer assembly formed of an integrally molded shell with a front panel structurally secured to the outer face of the front wall thereof. The shell has an undulated bottom forming drawer slide tracks, card supporting slide tracks and a guide track groove for a card compactor means, and also defines card stop ribs on the inner face of its front wall. The compactor means groove is closed on its sides and bottom and open at the top, with two horizontal rails projecting from the sides of the groove to partially hood the top thereof.

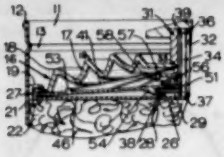
3,640,422
RESEALING CLOSURE FOR CANS AND THE LIKE

Jonas C. Harschel, 8 Maripasa Court, Burlingame, Calif.

Filed Mar. 9, 1970, Ser. No. 17,375
Int. Cl. B65d *39/12*
U.S. Cl. 220—24.5 7 Claims

A closure to fit cans to reseal same when the contents have been partially removed. Top and bottom radially stretchable diaphragms enclose top and bottom flexible disks. Top flexible conical member is depressed by a handle and has means cooperating with means on the bottom flexible conical member to first radially expand the latter and then to lock

the same in expanded condition so as to force the edges of the diaphragms into sealing engagement with the can wall.



Pulling the handle upward disengages the flexible members from each other and permits the parts to assume collapsed condition out of sealing contact with the can wall.

3,640,423

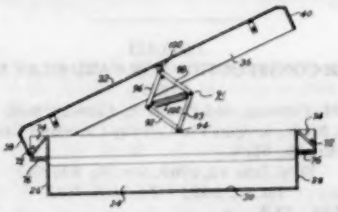
TOOLBOX FOR PICKUP TRUCK

Shirley L. Parker, Warsaw, and John D. Rohrer, North Manchester, both of Ind., assignors to Parker Industries, Inc., Silver Lake, Ind.

Filed July 1, 1970, Ser. No. 51,599

Int. Cl. B65d *43/16*

U.S. Cl. 220—31 R **8 Claims**



A toolbox for mounting across the bed of a pickup truck, the box having an elongated rectangular body and a cover, and a latch means at each end of the cover for releasably securing the cover to the body. Either of the two latch means can be released, thereby permitting the respective end to be raised while the other latch means functions as a pivot for the cover. A yieldable support is included near the longitudinal center of the body, to support the cover in an elevated position when the box is open. A single operating means is included at each end of the cover for operating the latch means which automatically locks when the end of the cover is lowered to closed position.

3,640,424

SEALING FOR UNDERWATER CAMERA HOUSING

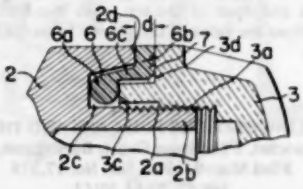
Sadanao Ando, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Mar. 23, 1970, Ser. No. 22,073

Claims priority, application Japan, Mar. 24, 1969, 44/26416

Int. Cl. F16j *9/00*; F16k *41/00*

U.S. Cl. 220—46 R **2 Claims**



Sealing is provided for sealing both of the water and sand for underwater camera housing so as to prevent the wear and abrasion of the packing and screw threads by the sand. A packing consisting of a main body, a flange and an intermediate bridge portion therebetween, all formed integrally, is used. Watertightness is achieved mainly by the main body which is fitted in an annular groove formed around the base of an externally threaded cylindrical portion of the casing encasing therein a camera and compressed by the end face of an inwardly extending, internally threaded cylindrical portion of a cover having an optical window. Watertightness and sandtightness are achieved by the flange portion of the packing which is interposed between the end faces of the flanges of the casing and cover.

3,640,425

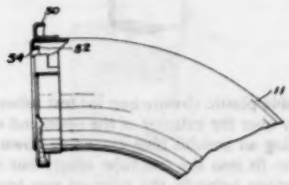
FILLER TUBE CONSTRUCTION FOR GASOLINE TANK

Louis J. Auer, 3111 Northeast 51st Street, Apt. 404, Fort Lauderdale, Fla.

Original application July 5, 1968, Ser. No. 742,560, now Patent No. 3,506,155. Divided and this application Jan. 23, 1970, Ser. No. 5,251

Int. Cl. B65d *41/00*

U.S. Cl. 220—86 R **4 Claims**



The specification discloses a tank for inflammable liquids, such as a gasoline tank for a motor vehicle, having filler tube including an improved construction of its upper end receiving the sealing cap. The disclosed construction provides a tight sealing joint between the tube and the cap and eliminates some serious disadvantages of the prior construction. The filler tube end is made in two pieces in order to eliminate the difficulties of producing the desired construction by stamping due to substantial length of the tube. At the same time the disclosed construction eliminates a passage in the juncture of the two pieces leading from the inside of the sealed space within the tube to the outside thereof and some other disadvantages known to have created serious difficulties and having safety implications. The construction possesses a number of additional advantages by virtue of having the cam plate thereof disposed on the outside of the filler tube sealing edge.

3,640,426

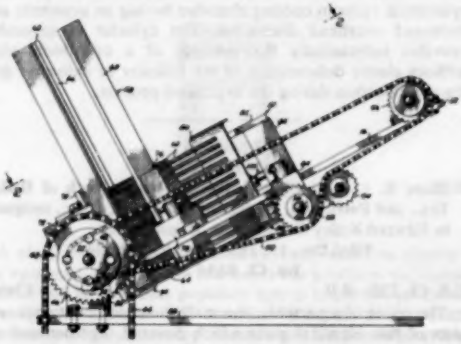
DEVICE FOR SEQUENTIALLY DISPENSING SETS OF SHEETS

Marvin H. Hammer, 1724 West Mulberry Drive, Phoenix, Ariz.

Filed Nov. 12, 1970, Ser. No. 88,578

Int. Cl. B65g *59/06*; B65n *3/30*

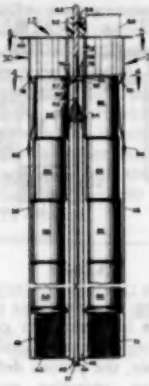
U.S. Cl. 221—67 **8 Claims**



A collating feeder for sequentially dispensing individual sets of sheets from a stack of crisscrossed sets. The stack is supported by two alternatively operative escapement means

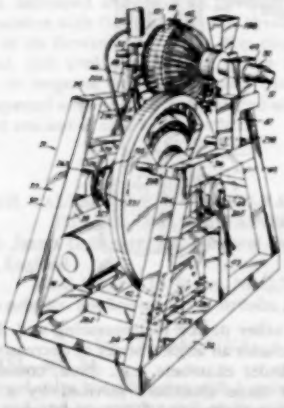
that oscillate into engagement with alternate sets to dispense the sets sequentially.

3,640,427
PLURAL STACK DISPENSER HAVING COMMON ACTUATION FOR STACKS
Bruce F. House, Miami, Fla., assignor to Shelley Manufacturing Company, Miami, Fla.
Filed Sept. 22, 1970, Ser. No. 74,417
Int. Cl. B65g *59/02*
U.S. Cl. 221—127 **10 Claims**



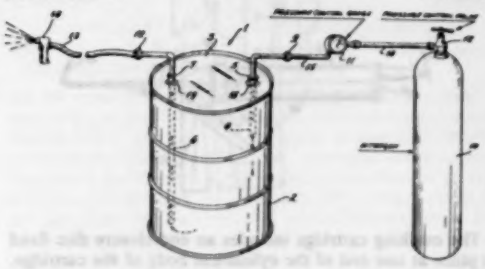
Beverage containers are dispensed selectively from a plurality of dispensing receptacles by actuation of a single actuator which is common to all of the receptacles. Each receptacle has a mouth at the top thereof and a stop spaced below the mouth less than the height of a container. Resilient means urges a stack of containers upwardly in each of the receptacles against the stop therein. The common actuator is selectively engageable with the uppermost container in each of the receptacles to disengage that container from its stop. The stack then moves upward to engage the next container in the stack with the stop. Thus, a single actuator serves all of the dispensing receptacles in a group.

3,640,428
SEED-CONTAINING PELLET-DISPENSING EQUIPMENT
Philip B. Knapp, Lynbrook, N.Y., assignor to Aptek Industries, Inc., Lynbrook, N.Y.
Filed Sept. 4, 1969, Ser. No. 855,289
Int. Cl. B23a *7/04*
U.S. Cl. 221—211 **19 Claims**



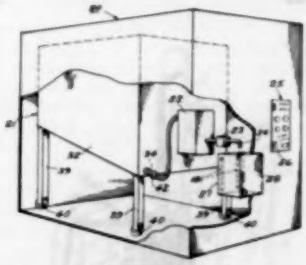
A seed-containing pellet-forming equipment for automatically removing a single seed at a time from a mass of seeds and depositing such seed into a mold cavity which previously had been loaded with a charge of pellet-forming material and after the seed is deposited onto such charge, loading a second charge of such material into the cavity and then compressing the contents of the cavity to form such pellet.

3,640,429
METHOD OF DISPENSING AN INDUSTRIAL SPRAY USING BOTH A PROPELLANT-DISPERSANT AND GAS PRESSURE
Carl N. Campbell, Kirkwood, Mo., assignor to Camie Company, Inc., St. Louis, Mo.
Filed Oct. 12, 1967, Ser. No. 674,916
Int. Cl. B67b *7/00*
U.S. Cl. 222—1 **4 Claims**



A bulk lot of silicone fluid, precharged with Freon or Genetron 11, contained in a storage drum. At the site of use a nitrogen tank and a spray nozzle are connected to fittings through the drum head.

3,640,430
BULK DISPENSING SYSTEM
James Gordon Roberts, Omaha, Nebr., assignor to Roberts Dairy Company, Omaha, Nebr.
Filed July 22, 1969, Ser. No. 843,649
Int. Cl. G01g *17/04*
U.S. Cl. 222—1 **50 Claims**



The bulk dispensing system serves to dispense metered amounts of one or more refrigerated or nonrefrigerated products in either individual consumer or commercial consumer amounts. In one embodiment, the system dispenses food products and includes a bulk container of 50 to 250 gallon capacity mounted in portable or stationary manner within a refrigerated cabinet. The bulk container detachably connects to a metering mechanism and to a dispensing mechanism so that predetermined amounts of food product can be dispensed. The metering and dispensing mechanisms can be operated automatically by a coin operating mechanism or by manual means. The system can be employed with onsite cabinets, or mobile units and may or may not be refrigerated. The system is maintained under sanitary conditions at all times and can either dispense one product or

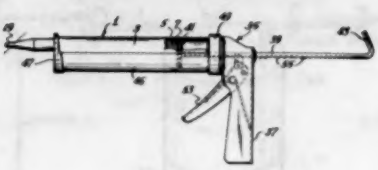
a selected one of a number of different products directly into a container supplied by the consumer or can be dispensed into a container supplied by the system. In the latter case, the system can also dispense filled containers of all types for removal by a consumer. Specially selected inert gas atmospheres can be used in assisting in the dispensing as well as the presentation of the product.

3,640,431

SHUTOFF NOZZLE FOR CAULKING CARTRIDGE

Lawrence H. Plumer, Rutland, Vt., assignor to Rutland Fire Clay Company, Rutland, Vt.

Filed Apr. 13, 1970, Ser. No. 27,537
Int. Cl. G01f 11/06
U.S. Cl. 222—48 6 Claims



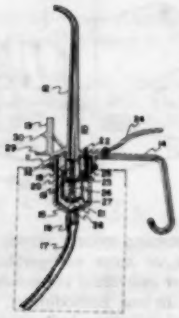
The caulking cartridge includes an end closure disc fixed in place at one end of the cylindrical body of the cartridge. The shutoff discharge nozzle comprises a circular base or flange portion seated against the end closure disc and rotatably mounted relative thereto. The dispensing opening formed in the closure disc and the discharge passage in the nozzle, which are radially offset with respect to the axis of rotation of the nozzle by substantially the same distance, may be aligned to permit dispensing of the material or nonaligned to prevent dispensing and drooling of the material upon rotation of the cartridge body relative to the discharge nozzle without removing the cartridge from the caulking gun.

3,640,432

CAN-MOUNTED PUMP DEVICE

Mike L. G. Cowley, P. O. Box 208, Coeur D'Alene, Idaho

Filed Mar. 23, 1970, Ser. No. 21,739
Int. Cl. B67b 7/26
U.S. Cl. 222—82 3 Claims



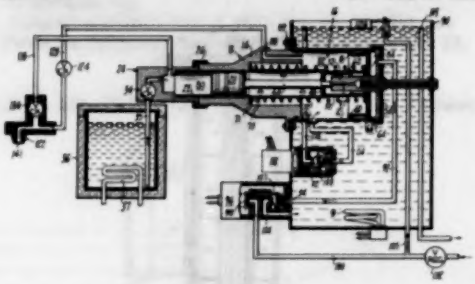
The can-mounted pump device comprises a housing including a hand pump assembly, a spout for dispensing viscous lubricants, and cutter means carried by the housing operable to cut a opening in a can container package, the opening being operable to receive the can-mounted pump device of the present invention.

3,640,433

BEVERAGE DISPENSER FOR METERING A PLURALITY OF LIQUIDS

Joseph J. Rodth, Swansea, Mass., assignor to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of application Ser. No. 681,219, Nov. 7, 1967, now abandoned. This application July 11, 1969, Ser. No. 842,793
Int. Cl. B67d 5/56
U.S. Cl. 222—129.2 39 Claims



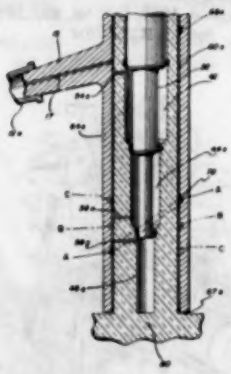
Apparatus including a plurality of coaxial pistons reciprocable in unison in a chamber of a pump body for simultaneously admitting different fluids to and discharging them from the chamber, the pistons defining fluid-metering compartments and an operating compartment in the chamber, means for supplying fluids to the chamber including a tank for one of the fluids, and supply and return means including a conduit in permanently open communication with the operating compartment for alternatively supplying said one fluid in raw condition thereto for operating the pistons and for returning said one fluid when spent to the tank to be conditioned for subsequent discharge.

3,640,434

VARIABLE CAPACITY FLUID-DISPENSING DEVICE

Clarence L. Walker, Webster Groves, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed May 15, 1970, Ser. No. 37,809
Int. Cl. B67d 5/02
U.S. Cl. 222—144.5 19 Claims



A pipette or other device for measuring and dispensing liquids which includes an aligned series of decreasing diameter, stepped cylinder chambers, e.g., three, contained in a barrel with the three chambers serviced by a common stepped piston for emptying and filling a receiver or reservoir

carried by the device in communication with the chambers. A chamber at one end of the array is maintained in unobstructed flow communication with the receiver or reservoir which may or may not be a removable tip or nozzle on the device. A vented passageway communicates with vent ports from each chamber. A valving member is provided in the passage for selectively venting one or more of the chambers or connecting them in flow communication with the receiver or reservoir.

In a specific form, the passageway can be formed between the barrel and a sleeve or collar surrounding the barrel which is rotationally slidable on the barrel. The valving member can be in the form of an elliptical ring on the inner surface of the sleeve or collar in sealing sliding engagement with the barrel outer surface, the ports of two of the other chambers falling between the longitudinal extents of the elliptical ring; and the center of the elliptical ring being located between the two ports. Rotation of the sleeve to a position placing the ring between the port vents one port while placing the other in flow communication with the nozzle, and rotation of the sleeve 90° one way or the other vents both ports or places both in flow communication with the nozzle to increase or decrease the liquid handling capacity of the device depending on the direction of rotation.

3,640,435

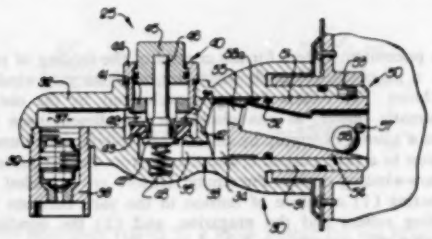
SOAP-DISPENSING METERING PRESSURE VALVE

Earl L. Morris, 1501 North Cloister Road, Whittier, Calif.

Filed Apr. 29, 1970, Ser. No. 32,985

Int. Cl. G01f *11/36*

U.S. Cl. 222—335 **2 Claims**



In a pressurized soap-dispensing system, a metering valve having a valve body including an inlet to be connected to a soap supply line and a forward outlet end for discharge of the soap and a fluid duct therebetween, a pushbutton-type valve mechanism carried by the body for selectively opening and closing the fluid duct, and a metering device for controlling the amount of soap discharged from the valve when the pushbutton is depressed including an inclined fluid passage in communication with the fluid duct and having a reduced area opening at its forward end and a stop pin at its rearward lower end, and a closure element in the inclined passage movable in response to dynamic soap pressure when the valve is opened so as to close the reduced area opening after a metered amount of soap is discharged.

3,640,436

AEROSOL VALVE FOR USE IN HIGH-RATE PRESSURE FILLING OF A CONTAINER

Frederick James Gallagher, 89, Balmoral Drive, Hayes Middlesex, England

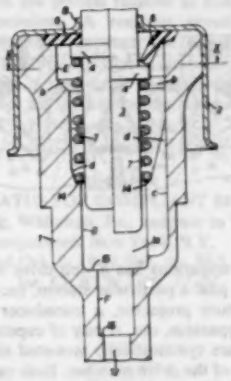
Filed Jan. 14, 1970, Ser. No. 2,716

Claims priority, application Great Britain, Jan. 17, 1969, 2,915/69

Int. Cl. B65d *83/14*

U.S. Cl. 222—402.24 **3 Claims**

An aerosol valve has a housing with a main flow passage at its inner end and an annular seal at its outer end. A valve stem extends through the seal and is movable inwards against a coil spring to open the valve in normal use, and to permit pressure filling by inward deflection of the seal. The internal cross section of the housing over a substantial part of its



length is square and flow channels extend from corners of the square through the housing around the outside of the coil spring. Specific characteristics of the seal and spring are stated.

3,640,437

PACKAGE FOR AMPOULES CONTAINING LYOPHILIZED PRODUCTS

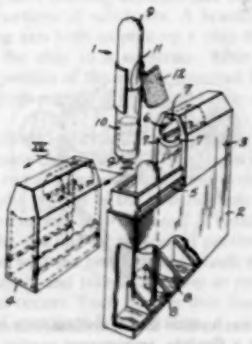
Michel Galy, Lyon, France, assignor to Societe Anonyme dite: Institut Merieux, Lyon, France

Filed Dec. 29, 1969, Ser. No. 888,370

Claims priority, application France, Dec. 27, 1969, 180,929

Int. Cl. B26f *3/00*

U.S. Cl. 225—96.5 **5 Claims**

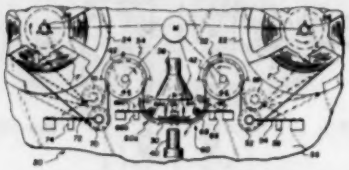


A package for ampuls containing lyophilized products comprising a box adaptable to contain a plurality of the ampuls and formed of at least two assemblable elements, two of which each have an internal orifice for engaging an end of the ampul over a certain length thereof so as to allow breaking of the ampul by grasping one element in each hand.

3,640,438
WEB-HANDLING APPARATUS

John E. Morse, and Norman J. Rosenburgh, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 4, 1970, Ser. No. 16,431
Int. Cl. B65h *23/26*; G11b *15/28*
U.S. Cl. 226—25 25 Claims

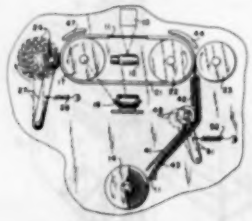


Web-handling apparatus has a web drive member for advancing the web past a particular station, such as a film gate of a motion picture projector, a transducer of a magnetic tape transport apparatus, etc. A pair of capstan members for driving the web are symmetrically mounted along a web path at opposite sides of the drive member. Both capstan members are driven simultaneously in a direction for advancing the web toward the drive member, and they are both driven at a speed that exceeds the normal maximum speed or velocity that can be imparted to the web by the drive member so that slippage continuously occurs between the web and the capstan members. The web-handling apparatus can maintain static and dynamic tensions and tension variations in the web adjacent the web drive members at very low levels, thereby avoiding forces that tend to create web damage and avoiding undesired movement of the web at the station that can produce unsatisfactory reproduction of images or other record information on the web. Various embodiments of the capstan devices are disclosed.

3,640,439
DEVICE FOR ADVANCING AN ENDLESS WEB OF FLEXIBLE STRIP MATERIAL

Lynn A. Selke, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 6, 1970, Ser. No. 9,173
Int. Cl. B65h *23/18*
U.S. Cl. 226—32 9 Claims

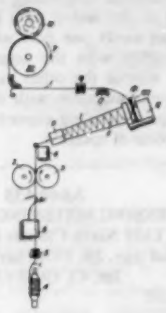


An advance mechanism for an endless web of flexible strip material utilizes a flexible, transparent carrier belt having a web-receiving channel therein. The web is trapped in the channel and is supported by the belt as it is moved thereby through the transducer area. A circuit for controlling the belt advance, and thereby the web advance, includes a differential optical detector for observing the position of a reference mark on the web after the web has been advanced. Deviation from the desired position of the mark causes the generation of an error signal which in one embodiment actuates the advance mechanism to correct the error. In another embodiment, the error signal is used to cause the following advance step to be either greater or lesser than normal depending upon the direction of deviation.

3,640,440
PNEUMATIC CIRCUIT FOR CONTROLLING THE FEEDING OF YARN INTO A YARN MAGAZINE

Jaroslav Sedlarik; Jiri Havlas, and Premysl Kostelecky, all of Liberec, Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Apr. 17, 1970, Ser. No. 29,539
Claims priority, application Czechoslovakia, Apr. 25, 1969, 2933-69
Int. Cl. B65h *23/18*
U.S. Cl. 226—34 10 Claims



A pneumatic system for the control of the feeding of yarn into a magazine in textile machines, such as yarn-winding machines. The system functions exclusively by the use of pneumatic power; in one disclosed embodiment yarn fed from a source of supply by driven feed rollers passes under tension to a yarn magazine, and thence from the magazine to a yarn-winding device. Pneumatic sensors are provided for detecting (1) a failure of tension in the yarn between the feeding rollers and the magazine, and (2) the condition wherein the magazine is full of yarn. Pneumologic means, into which impulses from the two sensors are directed, controls a pneumatic power means for stopping the feeding of yarn by the feeding rollers upon the presence of either one or both conditions (1) and (2).

In another disclosed embodiment, the pneumatic power means is under the control of only a pneumatic sensor which detects a failure of tension in the yarn between the feeding rollers and the magazine.

3,640,441
INTERMITTENT DRIVE MECHANISM FOR CINEMATOGRAPHIC APPARATUS

Eduard Kroznicki, Vienna, Australia, assignor to Karl Vockenhuber and Raimund Hauser, Vienna, Austria

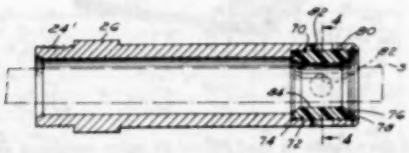
Filed Oct. 21, 1969, Ser. No. 868,073
Claims priority, application Austria, Oct. 23, 1968, A 10358/68
Int. Cl. G03b *1/22*
U.S. Cl. 226—49 10 Claims

An intermittent drive means for a cinematographic apparatus which is adapted to be used with perforated film. The intermittent drive means includes claw means adapted to engage and disengage the perforation holes of the film and to transport the same. A pair of cam means is rotatable about an axis in a single direction and has first and second cam surfaces. First and second cam follower means are connected with the claw means, and the first cam surfaces are adapted to impart forward film transporting motion to the claw means. The second cam surfaces are adapted to move the

claw means periodically in perforation engaging and disengaging position. Third cam means are coaxial to the cam means having first cam surfaces. The third cam means are adapted to impart reverse film transporting motion to the claw means and have third cam surfaces symmetrically to the

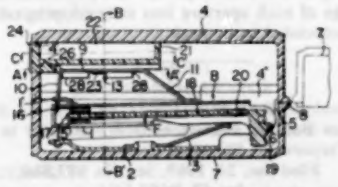
first cam surfaces with respect to a fictive surface being coaxial to the cam means. Transporting direction changing means are connected with the first cam follower means and are adapted to control the same for alternative cooperation with the first and the third cam surfaces, respectively.

3,640,442
STOCK PUSHER
Gilbert T. Lyon, 22501 Rio Vista, St. Clair Shores, Mich.
Filed Mar. 16, 1970, Ser. No. 19,818
Int. Cl. B65h *17/34*
U.S. Cl. 226—158 **7 Claims**



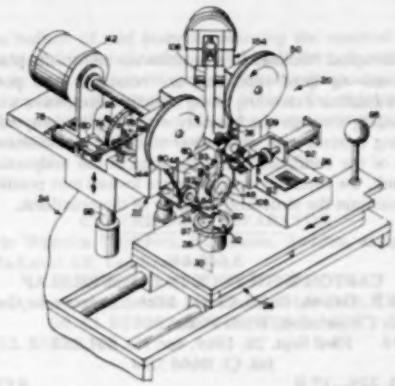
This disclosure relates to a stock pusher for use in automatic screw machines or the like and includes a urethane rubber body having a passageway therethrough for grippingly engaging the stock to be pushed. The urethane body may be either permanently or removably secured in the pusher shell at the end of the stock feed tube.

3,640,443
STAPLER
Kenichi Itagaki, Takasaki-shi, Japan, assignor to Max Corporation, Tokyo, Japan
Filed Dec. 12, 1969, Ser. No. 884,664
Claims priority, application Japan, Dec. 26, 1968, 43/94992
Int. Cl. B25c *5/02*
U.S. Cl. 227—120 **9 Claims**



A portable stapling apparatus having a closable housing which includes upper and lower cover members hingedly connected adjacent one end of the housing, which cover members when in a closed position define a closed chamber in which is positioned a stapling means. The stapling means includes a staple holding magazine and a staple base portion disposed for relative pivotal movement toward one another to permit a staple to be inserted into a selected article. The staple magazine and the base portion are each pivotally connected to the upper cover member whereby the magazine and base portion are pivotal relative to both the upper and lower cover members. A resilient pressing and driving mechanism is disposed between the upper cover and the magazine for permitting ejection of the endmost staple in the magazine. Further, a removable cartridge means is mounted in the upper cover for storing therein a plurality of spare staples.

3,640,444
APPARATUS FOR COMPLIANT BONDING
David P. Ludwig, Whitehall, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.
Filed Oct. 2, 1969, Ser. No. 863,259
Int. Cl. B23k *1/00, 37/04*
U.S. Cl. 228—4 **12 Claims**



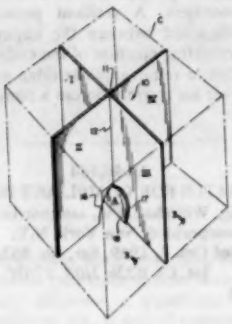
Compliant bonding of beam-lead devices such as integrated circuit chips is accomplished by engaging successive ones of the chips with successive portions of an apertured strip of a compliant bonding medium and bonding the chips to successive portions of substrates. A bonding head travels along a bonding axis both to pick up a chip from a tray and later to bond the chip to a substrate. After each bonding stroke a spent portion of the strip is removed from the bonding axis and a fresh portion is introduced onto the axis for the next bond.

In one illustrative embodiment the bonding head is in the form of a rotatable turret having a number of equally spaced tips projecting radially and outwardly therefrom. The strip is threaded around a portion of the circumference of the turret-like head. After each bond, the head is rotated until a different one of the tips and its associated portion of compliant strip are aligned with the bonding axis. Reels are provided to continuously supply and takeup the strip as progressive rotation of the head occurs. Each bond is thus made with an unspent portion of compliant bonding strip.

3,640,445
PARTITION DIVIDER
Robert E. Durham, Fort Worth, Tex., assignor to Container Corporation of America, Chicago, Ill.
Filed Sept. 22, 1969, Ser. No. 859,955
Int. Cl. B65d *25/04, 5/48*
U.S. Cl. 229—15 **2 Claims**

A partition structure for dividing a receptacle into a plurality of separate compartments. The structure is formed

from a cut and scored blank having a pair of interrupted foldlines extending along a common axis and a pair of interrupted slits extending laterally thereof to divide the blank into four quadrants defining partition members. A slit connects each of the aforementioned slits with a correlative one of the foldlines to define an area in the blank at the midportions thereof. Diagonally disposed quadrants are folded about



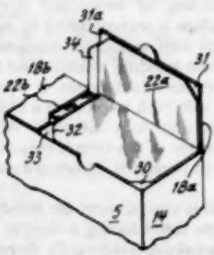
the interrupted foldlines to a position normal to the plane of the remaining quadrants, and are rotatable into position about a foldline extending along an axis coextensive with an axis passing through the laterally extending interrupted slits in sliding contact with each other to define a cruciform. By reason of the configuration of the area at the midportion of the blank, the rotatable quadrants are locked into position so as to maintain the structural integrity of the cruciform.

3,640,446

CARTON WITH TUCK-IN CLOSURE FLAP

Harold R. Grieve, Battle Creek, Mich., assignor to General Foods Corporation, White Plains, N.Y.

Filed Sept. 26, 1969, Ser. No. 861,253
Int. Cl. B65d *5/54*
U.S. Cl. 229—17 R **8 Claims**



The inner top closure flap of a rectangular carton is scored to permit easy opening, at least a portion of the inner flap remaining intact to constitute a lip beneath which a corresponding portion of the outer closure flap may be tucked to retain the flaps in reclosed position.

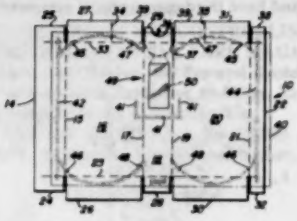
3,640,447

CARTON WITH SEPARATE INTERIOR POCKET

Hampton E. Forbes, Jr., Wilmington, and Lawrence J. La Freniere, Newark, both of Del., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 3, 1969, Ser. No. 863,593
Int. Cl. B65d *5/56, 5/72, 77/28*
U.S. Cl. 229—17 R **2 Claims**

A carton structure formed from a single blank of paperboard and including a film element adhered to the inside surfaces of one or more panels of said carton to form an interiorly positioned pocket between the film element and the carton panel for retaining a secondary item or the like isolated



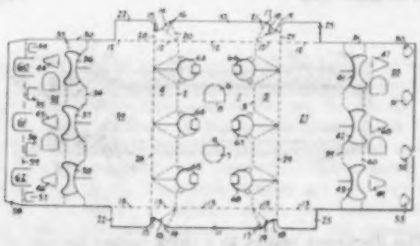
from the primary product in said carton but which is accessible through an access panel formed in one of the panels of said carton without disturbing the primary contents of the carton.

3,640,448

BOTTLE CARRIER

Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation

Filed Oct. 23, 1970, Ser. No. 83,427
Int. Cl. B65d *5/02, 71/00*
U.S. Cl. 229—40 **9 Claims**



A blank for forming a wraparound-type bottle carrier is provided with apertures for receiving the necks of packaged bottles, the apertures being disposed so as to hold the bottles in spaced-apart relationship and the apertures being constructed so as to facilitate entry of the bottle necks therein so as to grip the bottle necks after insertion into the apertures. In order to insert the bottle necks and subsequently to form the package, the bottles are arranged in two rows to form a group and the blank is placed thereabove with its ends in transverse disposition with respect to the rows of bottles. The ends are then bowed upwardly to facilitate inserting the bottle necks into the apertures. Thereafter the bottle carrier blank ends are folded downwardly and secured together underneath the bottles, the downward folding of the ends of the blank being effective to force web structures defining a part of the edge of each aperture into snug gripping relationship with the associated bottle neck.

3,640,449

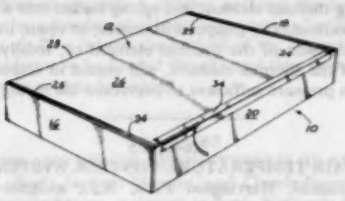
TRAY-FORMING CARTON

Donald Lee Bastian, Beaverton, Oreg., assignor to Western Kraft Corporation, Portland, Oreg.

Filed Dec. 24, 1969, Ser. No. 887,880
Int. Cl. B65d *5/54*
U.S. Cl. 229—44 **4 Claims**

A tray-forming carton comprises a folded sheet of stiff paperboard. It includes a bottom having side and end walls, and a top comprising an integral section of the sheet hinged through a fold line at one end to one of the walls of the bot-

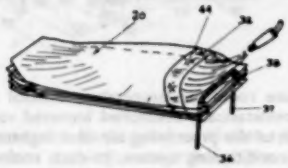
tom. A perforated tear line extends across the top, adjacent the fold line. The free end of the top-forming sheet section meets the opposite bottom wall, to which it is secured by releasable securing means such as tear tape. The resulting closed carton may be converted to a tray by releasing the securing means and tearing off the top along the perforated tear line.



3,640,450
WICKET BAGS

Abraham Buddy Lieberman, 4755 Boulevard des Grandes Prairies, St. Leonard, Montreal 457, Quebec, Canada

Filed Feb. 9, 1970, Ser. No. 9,626
Int. Cl. B65d *33/00*
U.S. Cl. 229—53 **2 Claims**



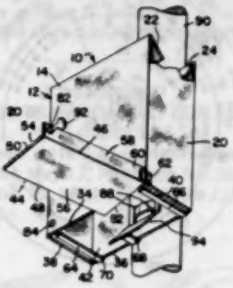
The invention refers to wicket bags in which each bag is made from any suitable flexible material, such as polyethylene, polypropylene or other equivalent materials, and has two vertical closed sides and a bottom closed side and leaving an open mouth forming the fourth side. The rear and front walls of the bags are of equal lengths and have their vertical edges heat-sealed for the greater extent of their lengths, thus forming closed vertical sides, and leaving the vertical edges of the upper portions of the rear and front walls freely independent from one another so as to form the open mouth of the bag. The upper portion of the front wall thus becomes a free transverse portion, which is capable of being folded in a downward direction on the exterior surface of its front wall to form a lip, and leaving the upper portion of the rear wall exposed and which is provided with apertures located adjacent to its top edge for engagement by the legs or posts of a wicket. When the bag is filled with the required items, it is removed from the wicket, and the position of the folded lip is then changed and extended in an opposite direction so as to cause the front wall to be of equal length to the length of the rear wall. The open mouth of the bag is then suitably closed and tied.

3,640,451
RECEPTACLE DEVICE

Linford H. Lewis, 3408 Ashville Street, Philadelphia, Pa.

Filed Aug. 6, 1969, Ser. No. 848,018
Int. Cl. B65f *1/00*
U.S. Cl. 232—43.1 **7 Claims**

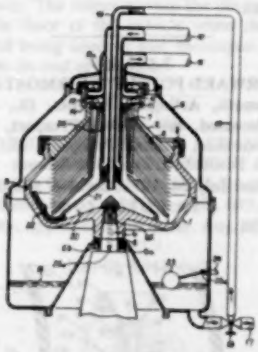
A receptacle device comprising a body providing a chamber for storing refuse therein, an opening at the top of said body for receiving refuse into the chamber of said body, an opening at its bottom for removal of refuse from the chamber of said body, and a bottom member hingedly secured with the body for pivotal movement between a first closed terminal position and a second open terminal position, said member enclosing the opening in the bottom of said body when it is in its closed terminal position for retaining refuse in the chamber of said body, and exposing the opening in the bottom of said body for allowing the removal of the refuse stored in the chamber of said body through said opening in its body when in its open terminal position, and including a plurality of elements at its bottom for engaging said member and guiding and positioning same as it is pivotally moved between its terminal positions.



3,640,452
CENTRIFUGAL SEPARATOR

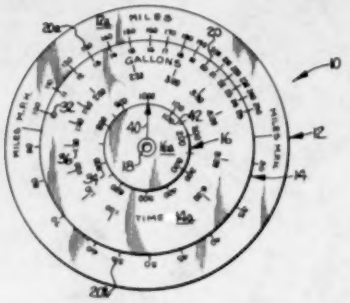
Henric Wilhelm Thylefors, Stockholm, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Oct. 13, 1969, Ser. No. 865,798
Claims priority, application Sweden, Oct. 14, 1968, 13806/68
Int. Cl. B01d *21/26, 43/00;* **B04b** *11/00*
U.S. Cl. 233—1 A **4 Claims**



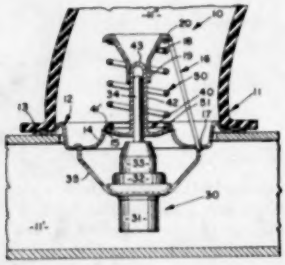
A liquid component separated in a centrifugal rotor is thrown therefrom into a surrounding housing where the level of the liquid component is controlled by an element responsive to changes in such level and operable to regulate the supply of a superatmospheric pressure gas to the interior of the housing, the latter having a bottom outlet for discharging the liquid component and which is subjected to a counterpressure.

3,640,453
PORTABLE COMPUTER
James J. Caillouet, Raleigh, N.C., assignor to American Imagination Corp., Raleigh, N.C.
Filed Nov. 10, 1969, Ser. No. 875,210
Int. Cl. G04f 7/04
U.S. Cl. 235—78 14 Claims



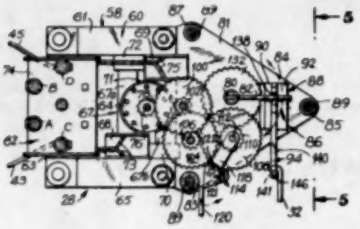
A portable computer comprising a planar base member having a circular, logarithmically spaced scale thereon indicative of a first value and having an opening disposed therethrough, a circular disc rotatably mounted in superimposed relation on the base member and having a logarithmically spaced scale disposed on a front face thereof which is indicative of a second value. The circular disc also has a logarithmically spaced scale on the back face thereof in alignment with the opening through the base member and being indicative of a third value which is the quotient of the first and second values so that when the circular disc is rotated relative to the base member with a predetermined first value aligned with a predetermined second value, then the resulting third value will be aligned in the opening in the base member. Preferably, the computer also includes an additional logarithmically spaced scale and an equally spaced scale on the circular disc member and also includes a second circular disc member having a fixed indicator means and an equally spaced scale thereon for cooperating with the first disc member to compute additional values. The portable computer may be specifically constructed for use by a motorist and the above scales include units indicating various motorist's values.

3,640,454
FORWARD POPPET THERMOSTAT
John S. Freismuth, Arlington Heights, Ill., and Nello L. Benedetti, deceased, late of Mt. Prospect, Ill. (by Lena Benedetti, executor, Mount Prospect, Ill.), assignors to Eaton Yale & Towne Inc., by said Freismuth
Filed July 24, 1970, Ser. No. 58,007
Int. Cl. F01p 7/16
U.S. Cl. 236—34 3 Claims



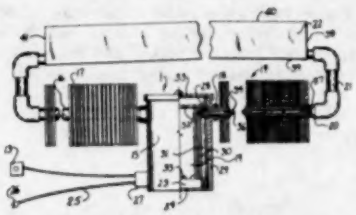
A thermostatic valve to be mounted in the coolant system of an internal combustion engine to control the flow of fluid through the system. A thermostatic valve of the forward poppet-type in which a single poppet cooperating with a single valve seating surface is independently responsive to both temperature and pressure for controlling the flow of fluid through said valve. The poppet is slidably engaged with the extending thermal element and spring biased into a seated or closed position. The poppet will unseat, or open, in response to an extension of the thermal element or, totally independently of the thermal element, will unseat in response to an upstream pressure sufficient to overcome the spring bias.

3,640,455
AIR TEMPERATURE CONTROL SYSTEM
Pat Romanelli, Harrington Park, N.J., assignor to Ram Domestic Products Company, Northvale, N.J.
Filed Feb. 6, 1970, Ser. No. 9,339
Int. Cl. F24f 7/04
U.S. Cl. 236—49 3 Claims



A multizone room air temperature control system comprises a thermostatically controlled louvered vent unit fitted to the mouth of the preexisting air duct register of the heating and air-conditioning system, in each room whose temperature is to be controlled. A continuously energized reversible shaded pole motor connected to the thermostat automatically opens and closes the vent louvres in response to room air temperature changes to thereby introduce or shut off the supply of either warm or cold air into the room for regulating the room air temperature independently of the other rooms.

3,640,456
SELF-CONTAINED STEAM HEATING UNIT
Clifford M. Sturgis, 1213 Westmoreland, Colorado Springs, Colo.
Filed June 25, 1970, Ser. No. 49,595
Int. Cl. F24h 3/08
U.S. Cl. 237—7 9 Claims



The invention is in a self-contained steam heating unit for heating an area or room, said unit being self-contained and not requiring any permanent connection or attachment to a liquid or heat source. The heating unit is a closed system including a radiator unit having a flow passage therethrough. A boiler containing a liquid and having a heater for heating the liquid and converting the same into steam is provided with a discharge distributing the steam through the radiator unit. A

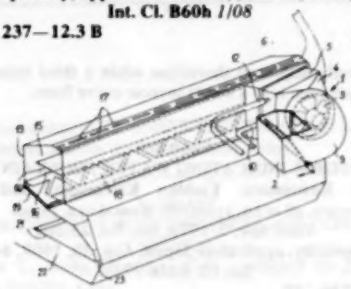
condenser chamber is connected to the radiator unit remote from the boiler, the condensed vapors returning to the boiler. A thermostat or the like is responsive to the temperature in the area to be heated and is operative to interrupt a circuit to the heater when the temperature in the area is above a predetermined amount. A cabinet encloses the heating unit and may be a baseboard cabinet type arranged with openings whereby air flow is from the bottom of the cabinet upwardly by the radiator to be heated thereby and then circulated into the room or area to be heated.

3,640,457

HEATING AND VENTILATION SYSTEMS OF VEHICLES

Andre Colinet; Jacques Mercier, and Claude Pernoud, all of Billancourt, France, assignors to Regie Nationale Des Usines Renault, Billancourt, France

Filed June 1, 1970, Ser. No. 42,137
Claims priority, application France, June 11, 1969, 19393
Int. Cl. B60h *1/08*
U.S. Cl. 237—12.3 B **5 Claims**



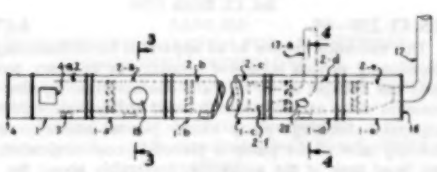
In this automotive heating and ventilation system comprising a fan, a heat exchanger connected to the engine-cooling water circuit a distributor chamber disposed beneath the windshield and formed in a transverse beam of the vehicle structure and communicating with the passengers' compartment through windshield demisting orifices and through a transverse passage substantially level with the floor, an air inlet box, the fan, a divergent pressurizing chamber and the exchanger constitute an air fan unit mounted at one end of said beam, the latter being divided into two compartments by a horizontal partition leaving a passage between these compartments, the warm water from the engine cooling system circulating upwards through said heat exchanger of which the height corresponds substantially to the beam height.

3,640,458

HOT AIR GENERATOR WITH VARIABLE LENGTH CONDUIT

Paul Marie Perrinet, Merignac, France, assignor to SEMIA S.A., Merignac (Gironde), France

Filed Apr. 28, 1970, Ser. No. 32,545
Claims priority, application France, May 2, 1969, 6912362
Int. Cl. F24d *5/04*
U.S. Cl. 237—50 **5 Claims**



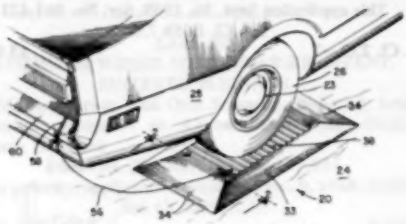
The invention relates to the art of hot air heating system, more particularly of the type having a plurality of interconnected units each including an inner and outer sleeve spaced to define an annular chamber therebetween with a heat generating means associated with the first of said units and having an associated blower or suction fan to draw ambient air into the system and force such air through the passageway defined by the interconnected inner sleeves which form a combustion chamber and through the annular passageway defined by the interconnected annular chambers which form a heat exchanger chamber, the end of the system being closed and having a discharge pipe connected to the adjacent inner sleeve for exhaust of gases, said outer sleeve having a plurality of outlets spaced along the length thereof.

3,640,459

SKIDPROOF TRACTION MAT FOR AUTOMOTIVE VEHICLES

Samuel L. Preisler, 3210 Avenue H, Brooklyn, N.Y.

Filed May 13, 1970, Ser. No. 36,806
Int. Cl. B62d *55/08*; E01b *23/00*
U.S. Cl. 238—14 **3 Claims**



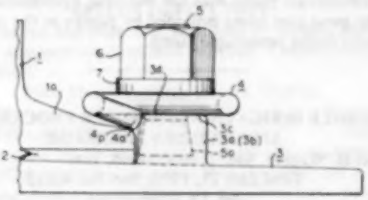
A traction pad for an automotive vehicle having pneumatic tires, that comprises a flat, flexible mat formed with transverse treads on its upper surface. Studs embedded in the mat extend out of the smooth bottom surface of the mat for engagement with a slippery roadway. The mat is rectangular and has long beveled side and end edges to provide an incline on which the wheel can roll. Each stud has a cylindrical body with a reduced diameter cylindrical pin portion extending outwardly axially of one end thereof. Ridges are provided on the bottom surface between rows of protruding stud pin portions to cooperate with the studs in holding the mat in place on the roadway. The ridges elevate the pin portions from the carpet on the floor of the vehicle when the pad is stored thereover and being used as mat thereupon. Draglines may be attached to an end of the mat.

3,640,460

RESILIENT INTERCONNECTION ARRANGEMENT FOR RAILS TO CROSSTIES

Wolfgang Baseler, Waldstrasse 20, 8031 Stockdorf, Germany

Filed Aug. 11, 1969, Ser. No. 849,047
Claims priority, application Germany, Aug. 10, 1968, P 17 84 462.1
Int. Cl. E01b *9/48*
U.S. Cl. 238—349 **8 Claims**



To provide for resilient interconnection between the holding element, such as a spike, screw connection, bolt or the

like of the base of the rail to the crosstie, a bowed spring is interposed between the head of the holding element (spike, bolt, etc.) which has a bowed loop portion essentially surrounding the holding element and a pair of divergent projecting wings, bowed slightly (a few millimeters) with respect to the loop portion and bearing over the base of the tie. The spring may be round or rectangular bar stock, and if rectangular, may be set on edge; the ends of the projecting wings have a reverse bend which bears against the inside of the edge of the shoulder, the loop portion bearing against the top surface of the shoulder of the tie plate.

3,640,461

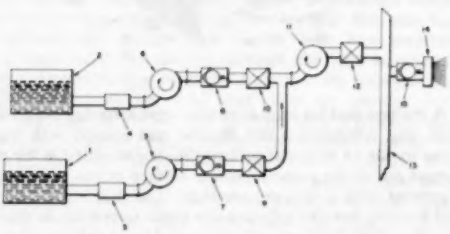
APPARATUS AND PROCESS FOR FORMING AND SPRAYING PESTICIDAL INVERT EMULSION

Laurel A. Koll, Ruleville, Miss., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of application Ser. No. 654,297, June 15, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 564,861, July 13, 1966, now abandoned. This application Sept. 26, 1969, Ser. No. 861,421

Int. Cl. B05b *7/04*

U.S. Cl. 239—7 **13 Claims**



Disclosed are an apparatus and a continuous process for making and spraying a pesticidal invert emulsion from a Newtonian-type aqueous phase and a Newtonian-type oil phase. In the apparatus and process the two phases are (a) introduced into a mechanical dispersing chamber and (b) established and maintained under hydrostatic pressure in said chamber sufficient to push from said chamber invert emulsion formed therein through a conduit to the outlet of a spray nozzle and out of said outlet as a spray. In the chamber the aqueous phase is mechanically dispersed in the oil phase at least until said invert emulsion is formed. Invert emulsion in the chamber is expelled therefrom to the outlet of said spray nozzle, and discharged as a spray into the atmosphere. In one embodiment the mechanical dispersing chamber is provided by a centrifugal pump with the requisite hydrostatic pressure for the most part being provided by pumps in the phase feed conduits to the centrifugal pump.

3,640,462

MOBILE IRRIGATION SPRINKLER PROCESS AND APPARATUSES THEREFOR

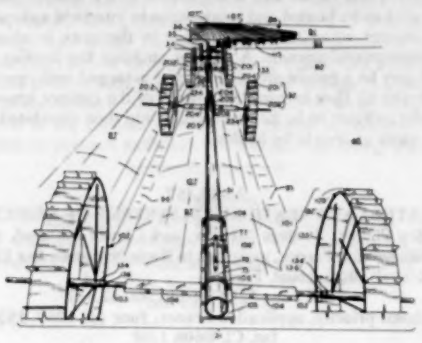
Milton H. Wagner, Rte. 1, Brownfield, Tex.

Filed Jan. 21, 1970, Ser. No. 4,632

Int. Cl. B05b *17/04*

U.S. Cl. 239—11 **5 Claims**

A tow-type irrigation apparatus and process operating without anchors wherein the moving pipe train is automatically maintained in a straight line along one portion thereof and along another portion parallel thereto and longitudinally



and laterally displaced therefrom while a third intermediate portion between is in a stable inverse curve form.

3,640,463

FORM-INDICATING WATER FOUNTAIN

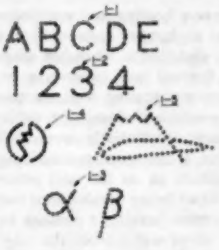
Koreichi Kawamura; Yoshiko Kawamura, and Koichi Kawamura, all of 66, Jyomyoji, Kamakura, Japan

Filed Apr. 2, 1970, Ser. No. 25,206

Claims priority, application Japan, Aug. 30, 1969, 44/68294

Int. Cl. B05b *17/08*

U.S. Cl. 239—17 **9 Claims**



A water fountain having a plurality of nozzles, which are arranged in a disposition suitable for representing one or more of letters, numerals, patterns, and forms.

3,640,464

APPARATUS FOR DISINFECTING AND DISINFESTING PREMISES

Jeremie Malczewski, Boulogne-sur-Seine, France, assignor to Societe anonyme dite: Bronzavia, Courbevoie (Haute-de-Seine), France

Filed June 1, 1970, Ser. No. 42,083

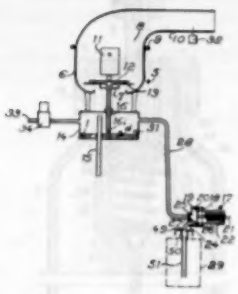
Claims priority, application France, June 3, 1969, 6918270

Int. Cl. B05b *3/10*

U.S. Cl. 239—69 **6 Claims**

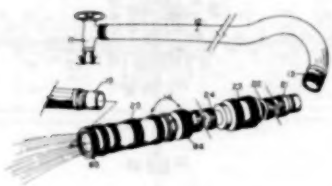
This invention relates to an apparatus for disinfecting and disinfesting various inhabited premises or quarters, particularly the cockpit of an aircraft, characterized by the combination of an aerosol generator and at least one volumetric adjustable discharge pump known per se, and wherein the delivery tube of the pump is placed in communication with the fixed tank of the generator, preferably above the maximum admissible level of the liquid and the suction tube is capable of being connected to a cartridge of the treatment product and a control programmer device is interposed between on the one hand a power source and on the other

hand the motor driving the or each disc of said generator unitary with the suction tube and the motor driving said pump in



order concomitantly to control their duration of operation and the instantaneous discharge of this pump.

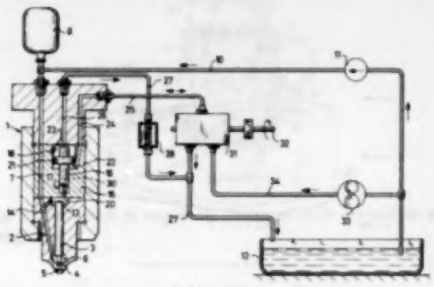
3,640,465
QUICK-CONNECT HOSE MEMBERS AND CONTROL SYSTEM
Margaret L. Hicks, Boulder, Colo., assignor to James C. Hicks, Boulder, Colo.
Filed Apr. 30, 1970, Ser. No. 33,196
Int. Cl. B05b *1/30*
U.S. Cl. 239—583 11 Claims



A hose system having releasable slide-fit inlet and outlet end coupling portions together with an on-off valve member and an adjustable spray nozzle member interconnected with lengths of flexible hose between the end coupling portions to be readily connected to and disconnected from the end of a variety of flow devices equipped with complementary slide-fit coupling portions so as to regulate flow therethrough and the spray through the outlet coupling portion.

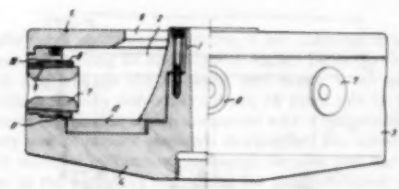
3,640,466
FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION PISTON ENGINE
Anton Steiger, Illnau/Zurich, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland
Filed Oct. 24, 1969, Ser. No. 869,035
Claims priority, application Switzerland, Nov. 5, 1968, 16457/68
Int. Cl. F02m *47/02*
U.S. Cl. 239—94 4 Claims

The valve needle is held closed under the differential pressure of the fuel acting at the ends of the needle. In order to open the valve, a low pressure is applied to lift the control valve body. This allows the fuel to pass from the rear fuel



chamber causing a pressure drop and a pressure differential to occur to unseat the needle valve.

3,640,467
ATOMIZER WHEEL WITH WEAR-RESISTANT, SINTERED BUSHINGS
Aage Moller, Farum, and Orla Straarup, Birkerod, both of Denmark, assignors to Aktieselskabet Niro Atomizer, Soborg, Denmark
Filed Oct. 28, 1969, Ser. No. 871,925
Claims priority, application Denmark, Nov. 5, 1968, 5367/68
Int. Cl. B05b *3/10*
U.S. Cl. 239—224 8 Claims

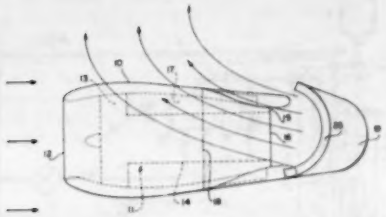


An atomizer wheel for the atomization of dispersions of very highly wearing materials for example a caoline dispersion, said wheel comprising an annular bowl-shaped space defined by a hub, a cylindrical wall concentrically surrounding the hub, and a bottom part connecting said hub and said wall. The wall is provided with a number of holes lined with bushings of a highly wearproof sintered material embedded in cylindrical bushings of a material able to resist tensile stresses such as steel or plastic, said cylindrical bushings fitting loosely in the holes and abutting at their outer end an inwardly projecting edge of the holes and with their inner ends projecting a distance into the annular space.

3,640,468
THRUST REVERSER FOR ASYMMETRIC EXHAUST EFFLUX DEFLECTION
Norman Searle, Marietta, Ga., and John W. Tatom, Franklin, Tenn., assignors to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Mar. 30, 1970, Ser. No. 23,826
Int. Cl. B64c *15/06*
U.S. Cl. 239—265.29 5 Claims

A scheme for increasing thrust reverser utilization particularly on STOL aircraft is provided whereby all of the exhaust efflux being diverted is deflected in an asymmetric direction away from the plane of the engine intake air. Exhaust ingestion is thereby reduced allowing more effective reversers to be used down to lower speeds with consequent reductions in ground roll of the aircraft. Preferably, this asymmetric

deflection of the exhaust efflux is directed upwardly at an angle to the horizontal to produce an additional load on the landing gear due to the vertical component of the reverse thrust enabling greater wheel-braking force to be applied for a given wheel ground friction coefficient.

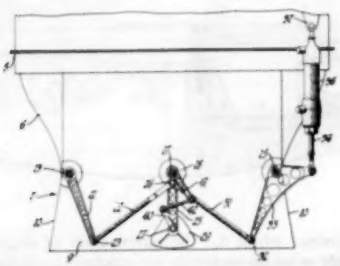


3,640,469

CONSTANT-AREA VECTORING NOZZLE

Charles F. Hayes, Indianapolis, Ind., and David R. Steffey, Allestree, Derby, England, assignors to General Motors Corporation, Detroit, Mich.

Filed July 14, 1967, Ser. No. 653,361
Int. Cl. B64c *15/04*
U.S. Cl. 239—265.35 **2 Claims**



A jet nozzle to vector the jet about a single axis. The outlet is bounded on two opposite sides by swingable outer deflecting vanes, and a central swingable vane is mounted midway between the outer vanes. Linkage connects the three vanes for movement such that the nozzle remains convergent and of substantially constant area over the range of travel of the vanes.

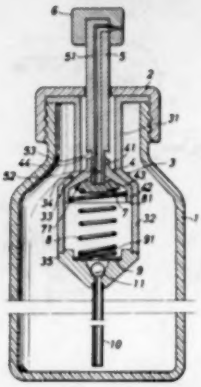
3,640,470

SPRAY PUMP

Rinnosuke Susuki, Tokyo; Hiroshi Hoshi, Narashino, and Shinichi Araki, Funabashi, all of Japan, assignors to Raion Yushi Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1970, Ser. No. 12,824
Claims priority, application Japan, Feb. 26, 1969, 44/17465
Int. Cl. A62c *11/02*
U.S. Cl. 239—333 **3 Claims**

A pump for spraying liquid finishing agents used in washing, medicines and the like comprising a cylinder consisting of an upper larger diameter portion, a lower larger diameter portion and a tapered portion interconnecting integrally said upper and smaller portions and having a suction port, and a piston axially movably fitted into said cylinder and having a tapered portion which is adapted to engage with said tapered portion of said cylinder. The positive spraying is ensured; the leakage of the liquid through the suction port can be positively prevented; and the air can be introduced through the suction port for replacement of the discharged or sprayed liquid.

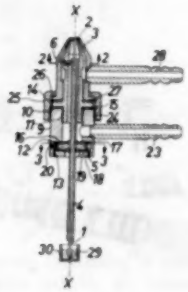


3,640,471

ANNULAR ATOMIZER FOR FLAME PHOTOMETRY

Ernst Winter, Jena, Germany, assignor to VEB Carl Zeiss Jena, Jena, District of Gera, Germany

Filed June 20, 1968, Ser. No. 742,120
Int. Cl. B05b *7/32*
U.S. Cl. 239—337 **1 Claim**



The annular atomizer is for use in flame photometry. Sensitive adjustment of the atomizer is ensured by means of a capillary tube at any time. This tube is surrounded by at least one nozzle and for the purpose of adjustment is tiltable all round near the orifice of this nozzle. The tilting motion is imparted to the tube at its end remote from the nozzle orifice.

3,640,472

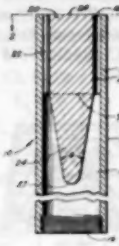
LIQUID DISCHARGE NOZZLE HAVING IMPROVED FLOW CONTROL MEANS

John O. Hruby, Jr., Burbank, Calif., and Rain Jet Corp., Los Angeles, Calif.

Continuation-in-part of application Ser. No. 784,541, Dec. 9, 1968, now Patent No. 3,558,053, Continuation-in-part of application Ser. No. 691,111, Dec. 8, 1967, now abandoned, Continuation-in-part of application Ser. No. 492,389, Oct. 4, 1965, now abandoned. This application Aug. 28, 1970, Ser. No. 67,917
Int. Cl. B05b *1/14*
U.S. Cl. 239—552 **15 Claims**

A family of aerating liquid discharge nozzles, each having an elongate body defining a duct therethrough between lower

and upper liquid inlet openings defined at opposite ends of the body, is described. A plug is disposed across the duct and has liquid flow passage means defined therethrough by a plurality of grooves formed in the plug sidewalls. The grooves are spaced uniformly around the circumference of the plug



and have an aggregate cross-sectional area substantially less than the cross-sectional area of the duct at the location of the plug in the duct. A conical projection extends from the plug toward the liquid inlet opening coaxially of the duct, the radius of the projection, at its base, being at least equal to the minimum radius of the plug.

3,640,473

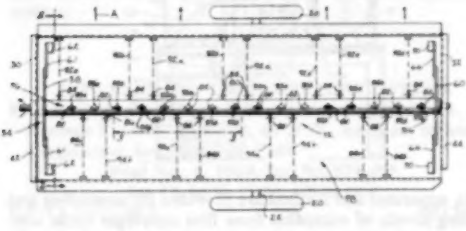
FLAIL-TYPE ROTOR FOR A MATERIAL SPREADER

Bryant F. Webb, and Bruce D. Schwalm, both of Leola, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Apr. 2, 1970, Ser. No. 24,999

Int. Cl. A01c *3/06*

U.S. Cl. 239—658 **1 Claim**



A flail-type material spreader has a semicylindrical tank for holding material and a rotor shaft extending the length of the tank with flexible flails connected thereto for discharging material on rotation of the shaft. The flails are arranged in groups of two assemblies and the assemblies are connected to the shaft at 90° to one another. Each assembly comprises two bending moments. The flails of one assembly are axially offset to form matching sets of flails along the shaft having bending moments in opposition to minimize the vibration of the rotor shaft.

3,640,474

IMPELLER FOR HEAVY DUTY COMMINUTING PUMPS

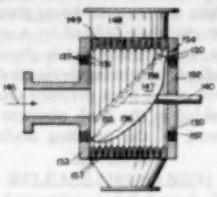
Georg Niedl, Im Bisch 664, Schoan, Liechtenstein

Original application May 3, 1965, Ser. No. 452,502, now Patent No. 3,502,274. Divided and this application Feb. 18, 1969, Ser. No. 822,342

Int. Cl. B02c *18/06*; **F04d** *29/04*; **B01d** *35/26*

U.S. Cl. 241—46.02 **7 Claims**

An impeller for heavy duty comminuting pumps may include a blade which is not only disposed in angular relation to its turning axis but may have an irregularly curved surface, or several such surfaces arranged to intersect each other



along a line which is angularly disposed with respect to the turning axis.

3,640,475

APPARATUS FOR BREAKING UP LUMPY MATERIAL

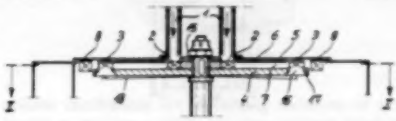
Richard Jung, Gummersbach, and Horst Lenkewitz, Derschlag, both of Germany, assignors to L & C Steinmuller GmbH, Gummersbach, Rhineland, Germany

Filed Apr. 1, 1969, Ser. No. 812,207

Claims priority, application Germany, Apr. 6, 1968, P 17 57 161.8

Int. Cl. B02c *13/18*, *13/24*, *13/288*

U.S. Cl. 241—55 **14 Claims**



Pulverizing equipment including a disc rotating on a vertical axis and having an inner row of impact elements thereon, which first engage the material and break it up and accelerate it radially outwardly toward an outer row of impact elements on the disc which cooperate with a surrounding stationary row of impact elements to complete the breaking up of the material. A housing surrounds the disc and has outlet means at the periphery of the disc for the withdrawal of pulverized material. A blower beneath the disc may supply air to the region of the periphery of the disc to assist in the withdrawal of the pulverized material from the housing.

3,640,476

STIRRING MILL

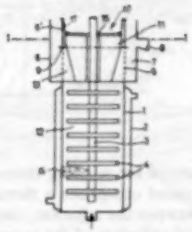
Kaspar Engels, Mannheim, Germany, assignor to Draiswerke GmbH, Mannheim-Waldhof, Germany

Filed Jan. 13, 1970, Ser. No. 2,485

Claims priority, application Germany, Jan. 14, 1969, P 19 01 593.1

Int. Cl. B02c *17/16*

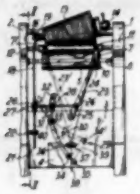
U.S. Cl. 241—74 **7 Claims**



Stirring mill for homogenizing, dispersing and comminuting solids in liquids comprising an upright milling container or housing filled with grinding bodies 0.2 to 3 mm. in size in

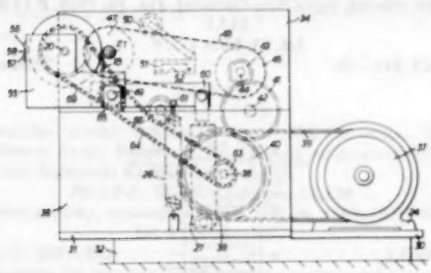
which a rapidly rotating stirring device is arranged and the material being ground is forced into the container from the bottom and leaves it by way of a separating device through the upper end, where the material being ground accumulates in a back pressure chamber defined by a cylindrical screen and a top element, where the outlet is above the cylindrical screen and the shaft of the stirring device is devoid of stirring elements in the area of the back pressure chamber and guide members are provided in the back pressure chamber which delay the movement of the grinding bodies and material being ground.

3,640,477
COIL WINDING MACHINE
Stefan Furst, Monchengladbach, Germany, assignor to Walter Reiners, Monchengladbach, Germany
Filed Aug. 14, 1969, Ser. No. 850,208
Claims priority, application Germany, Aug. 16, 1968, P 17 85 153.5
Int. Cl. B65h *54/02*
U.S. Cl. 242—18 R **2 Claims**



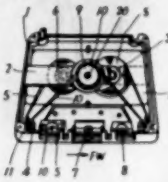
Coil winding machine for preferably conical cross-wound bobbins includes thread storage means for compensating for varying thread winding speeds, and means for automatically adjusting the length of the stored thread in accordance with the fullness with which the bobbin is wound.

3,640,478
WINDING APPARATUS
Hans Starke, Maidenhead, England, assignor to K.D.G. Instruments Limited
Filed Apr. 3, 1969, Ser. No. 813,120
Claims priority, application Great Britain, Apr. 11, 1968, 17,637/68
Int. Cl. B65h *54/08, 54/28*
U.S. Cl. 242—18 R **4 Claims**



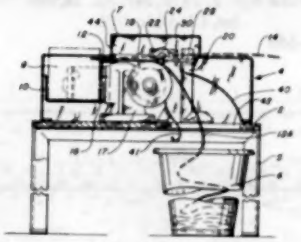
A winding apparatus for winding thread or the like onto packages at high speed comprises a thread guide consisting of a slot formed between the adjacent, closely spaced shaped edges of two coaxial cylinders of the same diameter, rotating together, the slot having helical segments, alternately left and right handed. The thread enters and leaves the slot at points which lie in a plane at right angles to the axis of rotation of the cylinder; preferably these points lie on or near a diameter of the cylinder.

3,640,479
CASSETTE TAPE DEVICE
Kiyoshi Hata, Kobe, Japan, assignor to Funai Electric Company, Limited, Osaka, Japan
Filed Oct. 26, 1970, Ser. No. 83,844
Claims priority, application Japan, Feb. 20, 1970, 45/14654
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 A **1 Claim**



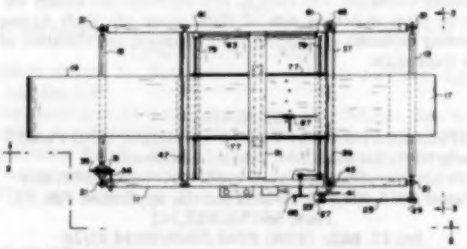
A tape cassette for tape recorders embodying a reel to reel tape and an endless tape wherein the tapes may be driven simultaneously or individually.

3,640,480
SCROLL STRIPPING METHOD AND APPARATUS
Nicholas P. Schleich, Golf, Ill., assignor to The Matix Corporation
Filed Mar. 9, 1970, Ser. No. 17,783
Int. Cl. B65h *19/20*
U.S. Cl. 242—56 **14 Claims**



An apparatus and method are provided for unwinding and guiding scrolls of microfilm from film cartridges while concurrently severing and separating the leader tape from the body of the unwound scroll.

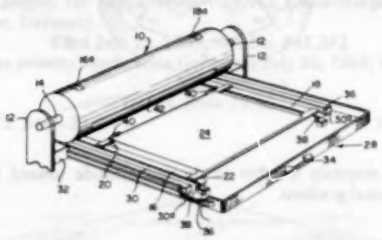
3,640,481
MULTIPLE BELT PUNCH
John G. Pugh, 1191 Monticello Road, Lafayette, Calif.
Filed May 12, 1969, Ser. No. 823,753
Int. Cl. B65h *35/02*
U.S. Cl. 242—56.8 **8 Claims**



A worktable for supporting rolls of belting at each end thereof and having a set of reciprocating punches mounted

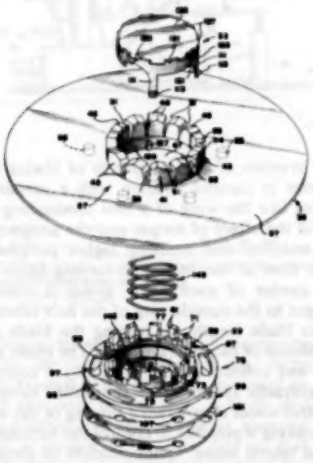
over the table for perforating the belting as it is transferred from one roll to the other.

3,640,482
PAPER FEED MECHANISM
Eric A. Von Hippel, Weston, Mass., assignor to Graphic Sciences, Inc., East Rochester, N.Y.
Continuation of application Ser. No. 689,641, Dec. 11, 1967, now abandoned. This application Mar. 19, 1970, Ser. No. 19,542
Int. Cl. B65h *17/00, 75/48*
U.S. Cl. 242—67.1 21 Claims



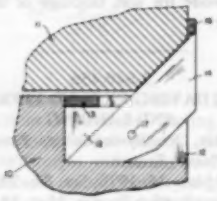
A device for quickly loading a document onto a drum for scanning or other purposes comprises a pair of bandlike spiral springs circumferentially wound around the drum adjacent its ends and exerting an inward force against the surface of the drum. Crossbands extending transversely between the springs hold the document flat against the drum surface under the force of the springs. The springs are each fastened to the drum at one end and are readily unwound from the drum by pulling on their free ends to extend them in a flattened position in which they receive the document for loading onto the drum. On release of the free ends the bands rewind around the drum to position the document against its surface.

3,640,483
TAPE REEL AND TAPE-THREADING SYSTEM
Fred R. Beck, Glen Ellyn; Robert J. Fanella, Villa Park, and Norman F. Gioia, Lombard, all of Ill., assignors to Ampex Corporation, Redwood City, Calif.
Filed Nov. 6, 1969, Ser. No. 874,495
Int. Cl. B65h *75/28;* G03b *1/04*
U.S. Cl. 242—74.1 10 Claims



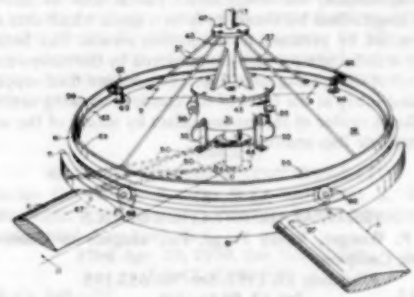
A leading end of a tape is readily threaded between a pair of gripping members which are movable from a tape-threading position in which a slot is formed therebetween to receive the leading end of the tape and a tape gripping position in which the gripping members move to grip the tape end therebetween. An actuator in the form of a pushbutton may be used to shift the gripping members relative to one another and into the tape-gripping position. Preferably, the tape end is released automatically by the gripping members when the tape is uncoiled.

3,640,484
RELEASE MECHANISM
Harry B. Porter, Lancaster, and Robert A. Weinhardt, China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy
Filed May 4, 1970, Ser. No. 34,033
Int. Cl. F42b *15/02*
U.S. Cl. 244—3.21 2 Claims



A release mechanism for stabilizing rollerons of a missile. The device comprises a cager of a bar magnet fixed in a slot in the wing of a missile adjacent the rollerons. The cager is shaped and secured so that its inertia causes it to rotate toward the rear when the missile is accelerated forward. In the caged position one end of the cager fits in a recess provided in a nonmagnetic rolleron housing thereby preventing movement of the rolleron relative to the wing. Magnetic attraction between the cager and an iron member mounted on the edge of the rolleron housing holds the cager in position until the setback force on the cager exceeds the magnetic force between the bar and said iron member. The bar then moves back into position in the wing slot and is held there by the magnetic attraction of another iron member positioned in the top wall of said slot.

3,640,485
AMPHIBIOUS HELICOPTER-TYPE AIRCRAFT
Jean L. Mutrux, 6 Sumac Lane, Clayton, Mo.
Filed June 25, 1970, Ser. No. 49,879
Int. Cl. B64c *29/00*
U.S. Cl. 244—12 C 11 Claims



A fuselage is formed by an inner circular housing forming a dome which is spacedly surrounded by an annular housing

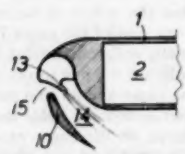
which forms a toroid. Thus the two housings form an annular venturi-type duct tapering downwardly and inwardly. Across the duct extend variable pitch radially disposed rotor blades driven from a ring driven by a prime mover in the inner housing for inducing downwash of air in the form of a vortex through the duct with resulting lift. Cyclic pitches of the blades are variously controlled by a tiltable swash ring having various elevations in the inner housing and acting as a cam for followers on linkages connecting the ring with the blades as they rotate. The double purpose of rotor pitch changes is to vary lift force and to trim the craft to level or slanting attitudes in flight. Extending radially across the duct below the blades are adjustable counterrotation fins functioning in response to air downwash to prevent rotation of the fuselage. Extending tangentially across the duct below the counterrotation fins are adjustable navigating fins. These are grouped to form four banks of them in quadrature around the duct and are adjustable within their respective banks for directional navigation control. Pneumatic inflated retractible landing pads provide for soft landings of the craft and for flotation on water.

3,640,486

FLYING WING HAVING GROUND-EFFECT TAKEOFF AND LANDING

Jean Henri Bertin, Neuilly-sur-Seine, France, assignor to Bertin & Cie, Plaisir, France

Filed Mar. 24, 1970, Ser. No. 22,355
Claims priority, application France, Mar. 24, 1969, 6908543
Int. Cl. B60v *3/08*
U.S. Cl. 244—12 R **7 Claims**



Aerodyne for the transoceanic transport of freight, with a thick profile flying wing between thin longitudinal panels disposed in the direction of normal travel and provided at the bottom with transverse flaps adapted to project downwards or be retracted, one transverse flap being near the leading edge of the wing while other flaps are in an intermediate position and in a rear position, the said transverse flaps when in the downwardly extended position cooperating with the wing undersurface, the longitudinal panels and an intermediate longitudinal bulkhead, to form a space which acts as a cushion fed by pressure fluid-injection means. The latter comprise a static pump which is uncovered by the downward movement of the leading edge flap. The pressure fluid supply is provided solely at the front of the cushion, allowing action on the thrust center of the ground effect by means of the set of intermediate flap and rear flaps.

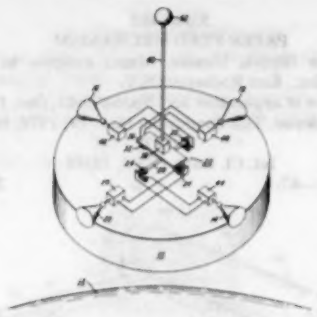
3,640,487

VERTICAL ORIENTATION DEVICE

Robert P. Wanger, Valley Forge, Pa., assignor to General Electric Company

Filed July 13, 1967, Ser. No. 653,195
Int. Cl. B64g *1/00*
U.S. Cl. 244—1 SA **4 Claims**

"Gravity-gradient" rod is connected to satellite by powered angular drive means controlled by attitude sensors which displace "gravity-gradient" rod in proper direction to produce increased torque by interaction with gravitational



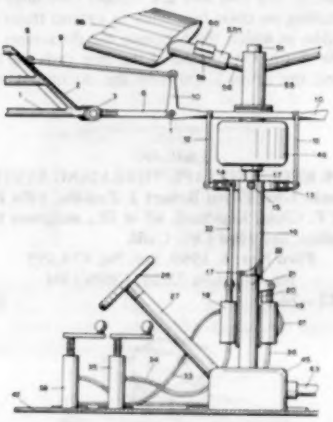
field to maintain satellite in desired attitude toward local gravitational gradient.

3,640,488

PEOPLE'S HELICOPTER

Franz Florschutz, 2300 Kiel, Kreienbarg 4, Germany

Filed July 15, 1969, Ser. No. 853,581
Claims priority, application Germany, Dec. 14, 1968, P 18 14 753.0
Int. Cl. B64c *27/82*
U.S. Cl. 244—17.19 **17 Claims**



The rotor consists of several groups of blades fixed to a slanting carrier in parallel position with a certain distance between them like the wing of a bird diminishing the rotor diameter, and the effect of torque and the unsymmetry, giving greater stability, and enabling higher peripheral speed whereby the flow at the backward-turning blade does not cease. The carrier of each blade group is connected by flapping hinges to the outside ring of the hub relatively large in relation to blade length. By turning the blade group the angle of incidence of blades is changed. The blade groups are periodically and collectively controlled by y control device based on a hydraulic system which is installed along the rotor shaft. A control wheel allows radial turning of the whole control device making it possible to control the helicopter in longitudinal and lateral sense. Compensation of torque and of the unsymmetry of rotor during forward flight is brought about by a long and large-surface rotor airfoil with counterweight which is installed variably and with opposite direction

of rotation on top of main rotor through a differential gear in the rotor head. This airfoil is stopped during forward flight by the flow of drive wind, so that the helicopter shows an unsymmetric airfoil giving a lift by which the unsymmetry of the stream of rotor is eliminated. Compensation of torque and of the unsymmetry of rotor works automatically without special control. The blade group rotor, blade control and torque compensation are a compact unit propelled by an engine which is installed in the fuselage before the pilot.

3,640,489

VERTICAL TAKEOFF AND LANDING AIRCRAFT

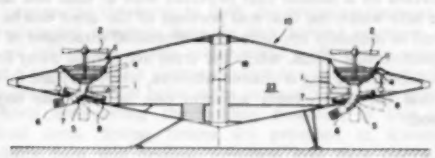
Karl Jaeger, Im Stillen Winkel 21, 43 Essen-Margarethenhohe, Germany

Filed July 28, 1969, Ser. No. 845,242

Claims priority, application Germany, July 26, 1968, P 17 56 879.5

Int. Cl. B64c *29/00*

U.S. Cl. 244—23 C **7 Claims**



A vertical takeoff and landing (VTOL) aircraft has a discus-shaped fuselage with a plurality of angularly equispaced lift-generating assemblies. Each assembly comprises a rotor above or flush with the fuselage, a compressor in the fuselage drawing air in from above, and a nozzle below the fuselage for expelling the air from the compressor in a jet. The nozzles can be rotated to point in any direction. Thus, according to the settings of the nozzles, the aircraft can rise or sink vertically and move in any horizontal direction.

3,640,490

SHIPBORNE CONVEYING MEANS

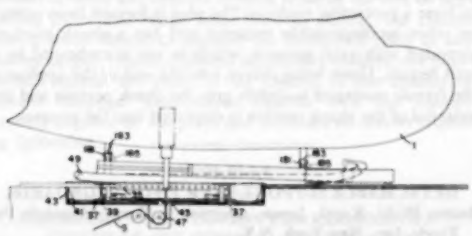
Asbjorn Baekken, Dartmouth, Nova Scotia, Dartmouth, Nova Scotia, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of National Defense of Her Majesty's Canadian Government

Filed Jan. 13, 1970, Ser. No. 2,528

Claims priority, application Canada, Jan. 21, 1969, 040,713

Int. Cl. B64f *1/22*

U.S. Cl. 244—116 **17 Claims**



The disclosure relates to means for transporting a landed helicopter on the deck of a ship at sea. A probe on the helicopter is grasped in a trap device mounted on a turntable provided on the deck of the ship. A dolly device is then moved into position and the helicopter clamped to it. The dolly device is guided by suitable rails so that, once the helicopter is clamped to it and unclamped from the trap device, the helicopter under full restraint can be moved along the deck to a parking space.

3,640,491

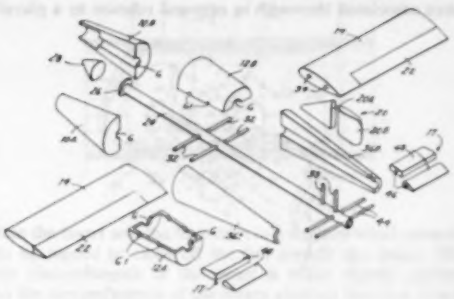
AIRPLANE CONSTRUCTION FRAME

Robert R. Harrison, 207 Earlington Road, Havertown, Pa.

Filed Apr. 15, 1970, Ser. No. 28,767

Int. Cl. B64c *1/00*

U.S. Cl. 244—117 R **2 Claims**



A prefabricated, unitary frame and a body formed in prefabricated sections, the frame having body sections receiving and supporting members, and the body sections being formed of lightweight and strong alloys, or synthetics, and being provided with complementary engaging means for quick and easy securement of said body sections to said supporting members.

3,640,492

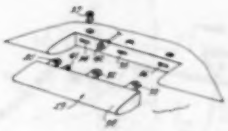
MODULAR AIRCRAFT STRUCTURES

Moe Star, Los Angeles, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.

Filed Feb. 19, 1970, Ser. No. 12,670

Int. Cl. B64c *1/00*

U.S. Cl. 244—124 **1 Claim**



A mission-oriented avionics complement for military and like aircraft is insured by the use of interchangeable units or modules containing electronic or avionic equipment. These units are packaged to form part of the aircraft structure and conform with and maintain the aircraft's aerodynamic configuration and mold lines. These units configured as sections of wing, fuselage, tail, etc., are provided with quick mechanical and electrical connect-disconnect mechanisms. Internally provided electrical cables serve to integrate the plug-in electronic elements with the internally mounted power supply, display and control elements thereby enabling them to perform a required avionic function.

3,640,493

BRACKET FOR MOUNTING APPARATUS

Charles O. Thelen, Roselle, N.J., and Hans J. Ziegler, Brooklyn, N.Y., assignors to Western Electric Company, Incorporated, New York, N.Y.

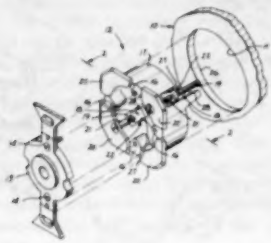
Filed Apr. 29, 1970, Ser. No. 32,839

Int. Cl. G12b *9/08*

U.S. Cl. 248—27 **3 Claims**

A bracket, which is adapted to be mounted in an opening formed in a wall, has a pair of tab members which are threadedly mounted on an associated pair of screws posi-

tioned in the bracket. The tab members are restrained for sliding motion relative to the bracket within a pair of slots formed in the bracket wherein each slot has a long edge and a short edge. As the screws are rotated in one direction, the tabs advance through the slots in a rearward direction. When each of the tabs clears the short edge of the associated slot, the tab is permitted to rotate 180° to position clamping surfaces associated therewith in opposed relation to a plurality

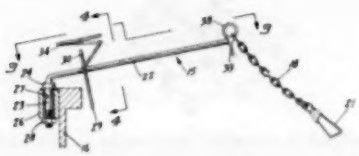


of flanges rigidly attached to the bracket and spaced forwardly of the tab. When the tab is in this position, portions of the wall adjacent to the opening are positioned between each flange and the clamping surfaces of the associated tab. Upon rotating the screws in the opposite direction, the tabs advance through the associated slots in the forward direction to clamp the edge of the opening in the wall between the tabs and the flanges, thereby mounting the bracket in the opening.

3,640,494
HOLDER

Lewis L. Ruter, 218 26th Ave. N., Apt. #7, Minneapolis, Minn.

Filed Mar. 2, 1970, Ser. No. 15,368
Int. Cl. A01k 97/10
U.S. Cl. 248—42 10 Claims



An elongated arm having a generally upright end portion positionable in the hole of an oarlock on a fishing boat for holding a floating fish basket in the water adjacent the boat. A stop member, secured to a portion of the arm adjacent the upright end, cooperates with the side of the boat to limit the pivotal movement of the arm relative to the boat and thereby maintain the arm in a generally lateral position with respect to the side of the boat. The outer end of the arm has a ring carrying a flexible chain attachable to the floating fish basket. Secured to spaced portions of the rod is a downwardly open loop and an upwardly open hook for accommodating a fishing rod. Located opposite the loop is an upwardly open spiral portion for accommodating a container, as a can, a box of worms or a container for liquid beverage.

3,640,495
REFUSE DISPOSAL ARRANGEMENT

Johannes Dietz, Apartado 61.800, Caracas, Venezuela

Filed Mar. 10, 1970, Ser. No. 18,195
Int. Cl. B65b 67/12
U.S. Cl. 248—99 10 Claims

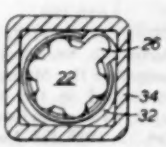
A refuse disposal arrangement includes a holder which is mountable on an upright support and includes a pair of arms each having a first end portion and a second end portion. Mounting means mounts the second end portions of these arms for turning movement in such a manner that the arms can turn together and with reference to one another about an upright axis common to them both. A plurality of disposable refuse bags are provided which are each releasably connectable with the holder and which each have an upper open end

encircled by a tubular cuff provided with at least one aperture into which the first end portions of the arms can be inserted in mutually opposite circumferential directions of the respective bag. Thus, when the arms are turned away from one another the bag is opened whereas, when they are turned so that they are closely adjacent one another, the bag is closed.

3,640,496
PLUG OR STOPPER FOR THE OPEN ENDS OF TUBULAR METAL APPLIANCES

Leslie C. V. Duncan, Emsworth, England, assignor to Southbourne Rubber Company Limited, Emsworth, England

Filed June 18, 1969, Ser. No. 834,939
Claims priority, application Great Britain, June 21, 1968, 56,995/68
Int. Cl. A47b 91/06
U.S. Cl. 248—188.9 2 Claims



A plug for insertion into an end of a metal tubular appliance, such as a leg of a chair or other article of furniture to form a protective cushion. The plug is formed from rubber or other incompressible material and has a shank portion, provided with axial grooves, which in use is embraced by a split ferrule. Upon being driven into the end of the appliance the ferrule contracts to tightly grip the shank portion and the material of the shank portion is displaced into the grooves.

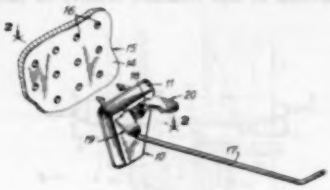
3,640,497
DETACHABLE SUPPORT DEVICE FOR PEGBOARDS

Isamu Waki, Kasai, Japan, assignor to Hartz Mountain Pet Foods, Inc., New York, N.Y.

Filed Oct. 27, 1970, Ser. No. 84,376
Claims priority, application Japan, Nov. 1, 1972, 45/2114
Int. Cl. A47f 5/00
U.S. Cl. 248—225 9 Claims

A support device for detachable connection to two adjacent holes in a pegboard or other perforated panel. A hollow casing of dished-in configuration has extending from the front wall thereof a support rod the rear end of which extends through said front wall and is bent upwardly. Two laterally opposite clamping members with overlapping wings

extend through an upper horizontally disposed slotted portion in the casing and are pivotally mounted over said upwardly bent rod, said members having front arms adapted for manual grasping, and rear arms with hooked portions adapted for insertion through two adjacent holes in the pegboard and for holding engagement with the rear surface of the pegboard. The respective clamping members have notched portions the respective opposite sides of each of which straddle the adjacent sides of said slotted portion and



are engageable therewith to limit the pivotal movement of said clamping members between two limiting positions. At one of said positions the said hooked portions are spaced apart a predetermined distance, which is equal to the spacing between two adjacent holes in the pegboard, the other of said positions determining the holding positions of the said hooked arms. Spring means are provided to normally yieldably urge said hooked members into their operative holding positions.

3,640,498

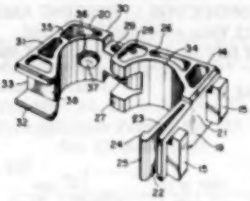
ADJUSTABLE SHELF AND CABINET STRUCTURE

Vytant Aleks, Rockford, Ill., assignor to The Brearley Company, Rockford, Ill.

Filed Jan. 12, 1970, Ser. No. 2,280

Int. Cl. A47b *96/08*

U.S. Cl. 248—230 **4 Claims**



The present clamps are designed to be attached to a cabinet or shelf and applied in open form to the side of supporting poles that reach from floor to ceiling, the clamps serving when closed to support the cabinet or shelf at any desired height. Friction buttons of resilient material are compressed against the poles in the closing of the clamps to prevent slippage. Snap-action catches lock the clamps securely in place on the poles and there are no screws requiring tightening.

3,640,499

REGISTER CONSTRUCTION FOR CLOSING OFF CIRCULAR-CYLINDRICAL FLOW DUCTS

Richard Jung, Gummersbach, Germany, assignor to L & C Steinmuller G.m.b.H., Gummersbach, Rhineland, Germany

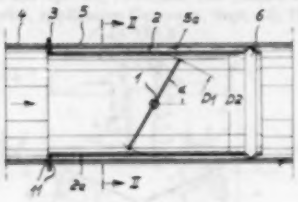
Filed Dec. 10, 1969, Ser. No. 883,748

Claims priority, application Germany, Dec. 11, 1968, P 18 13 885.7

Int. Cl. F16k *1/22*

U.S. Cl. 251—305 **3 Claims**

A register construction for closing off circular-cylindrical flow ducts includes a flexible cylindrical insert of a relatively thin material such as sheet metal or plastic which is mounted at one end to an annular flange which is secured to the flow duct and which includes an inner dimension which is slightly smaller than the duct with which it is to be associated. A circular flat plate valve or register member is pivotally mounted



within the insert and the flow duct in a manner which permits it to be moved to close off the full area of the insert. The inner circumference of the insert is made slightly smaller than the circumference of the rotary plate so that in a closed position a formtight closure between the plate and the insert is obtained to close off all fluid flow through the duct.

3,640,500

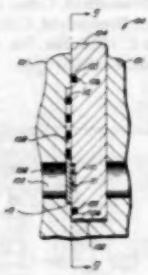
GATE VALVE WITH IMPROVED SEAL ASSEMBLY

William A. Rogers, 746 West 28th Street, San Pedro, Calif.

Original application Jan. 24, 1969, Ser. No. 793,790, now Patent No. 3,561,731. Divided and this application Dec. 30, 1970, Ser. No. 102,825

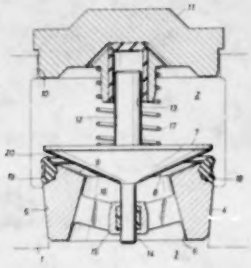
Int. Cl. F16k *3/02*

U.S. Cl. 251—326 **3 Claims**



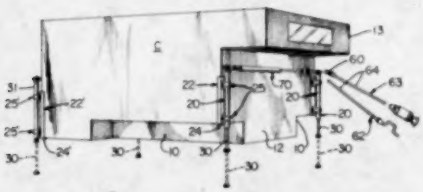
A valve having a body member defining a chamber with first and second ports, and a closure member movable in the chamber over the first port between open and closed positions to control flow between the ports. A resilient seal is mounted on either the body member or the closure member to seal the valve by bearing against a mating face of the other member when the valve is closed. A backup element is slidably mounted in the valve chamber to provide continuous confinement for the seal as the closure member is moved away from the closed position toward the open position. The backup element fits against the mating face member when the valve is opened to define a substantially continuous smooth surface in sliding contact with the seal and against which the seal is compressed. The smooth surface formed by the mating face member and the backup element is broken only by a line joint or seam between the member and element, and the seal passes easily over this joint without distorting or tending to extrude. After the closure member has retracted toward the open position sufficiently to pass the seal over the joint so the seal now bears entirely on the backup member, the closure member is further drawn past the first port to permit flow through the valve.

3,640,501
VALVE SEAL RING INCLUDING METAL RETAINER RINGS
George W. Walton, 8903 Devonshire, Dallas, Tex.
Filed Oct. 2, 1969, Ser. No. 863,274
Int. Cl. F16k 15/06
U.S. Cl. 251—332 4 Claims



A valve having a metal ring with an annular seating surface at one end and a relief about the seating surface. A closure element moves toward and away from seating engagement with the seating surface, and a seal ring is mounted in the relief and has an end which protrudes above the seating surface of the metallic ring in position to be engaged by the closure element. There are circumferentially interfitting parts on the adjacent surfaces of the seal ring and relief, and a pair of metal retainer rings fit closely in grooves about the seal ring for holding the seal ring in the relief.

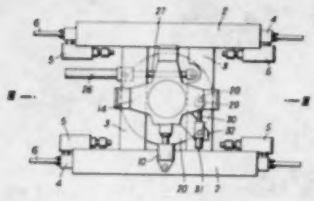
3,640,502
CROSS DRIVE FOR LIFT JACK APPARATUS
Dale L. Bargman, Jr., Broomfield, Colo., assignor to Colorado Leisure Products, Inc., Broomfield, Colo.
Filed June 1, 1970, Ser. No. 42,312
Int. Cl. B66f 7/26
U.S. Cl. 254—45 17 Claims



A lift jack apparatus for a camper body includes lift jack units rigidly secured to each corner of the camper, each jack unit including a lift mechanism, and a cross drive assembly is releasably connected between adjacent pairs of jack units to transmit actuation of one unit through the lift mechanism of the other unit in loading and unloading a camper body onto and from a truck bed.

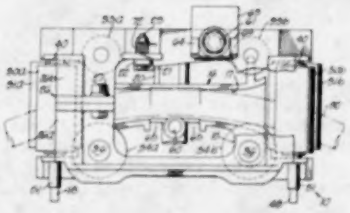
3,640,503
STEEL-CONVERTER-HANDLING VEHICLE
Ronald Spanniang, Linz-Ebelsberg, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria
Filed Aug. 3, 1970, Ser. No. 60,384
Claims priority, application Austria, Aug. 5, 1969, A 7522/69; May 21, 1970, A 4538/70
Int. Cl. B66f 3/00; B60s 9/14
U.S. Cl. 254—84 7 Claims

The disclosure relates to a steel-converter-handling vehicle for mounting and dismounting a converter in a converter stand and for transporting a converter between two or several converter stands, comprising a bearing structure for the converter which is liftable and lowerable and rotatable around a vertical axis, and a vehicle frame carrying the bogies which is transposable at track intersections, in which the improvement resides in that the vehicle frame is provided with a sledge which is displaceable transversely to the direction of travel and connected with a vertical lifting cylinder arranged within said vehicle frame, a piston which is connected with the bearing structure for the converter being vertically movable in and rotatable relative to said lifting



cylinder, and a supporting plate arranged within the vehicle frame being adapted for being pushed out in downward direction and thereby lifting the vehicle frame above the trackway. According to an embodiment of the invention, a single lifting device is used, affording a high simplicity of the construction and effect. It is possible to carry out adjusting movements horizontally and perpendicularly to the direction of travel and the converter is rotatable around the converter axis. The lifting means are adapted to absorb the lateral and tilting forces occuring when the converter is mounted or dismounted.

3,640,504
POWER CONDUCTOR STRINGING ASSEMBLY
L. E. Lindsey, 222 Vista Ave, Pasadena, Calif.
Filed July 30, 1969, Ser. No. 845,960
Int. Cl. E21c 29/16
U.S. Cl. 254—134.3PA 22 Claims



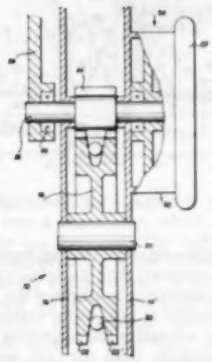
An article of manufacture for use in installing a power conductor along a power line while the conductor is being pulled across the outer end of installed insulators and supported closely above conductor clamping means carried by each insulator. When the conductor has been pulled into position antifriction supports therefor are released allowing the conductor to gravitate directly into the clamp seating channel without need for lifting the conductor. The stringing assembly and the insulator-supported clamping unit are designed for interlocking assembly during the stringing operation and the stringing assembly unit is thereafter readily separable from the clamping unit without need for tools.

3,640,505

WINCH OR HOIST WITH A FRICTION BRAKE DEVICE

Marcel Durand, Grenoble, France, assignor to Jean Pomagalski S.A., Fontaine, France

Filed Jan. 28, 1970, Ser. No. 6,356
Claims priority, application France, Feb. 5, 1969, 6902633
Int. Cl. B66d 1/30
U.S. Cl. 254—150 3 Claims



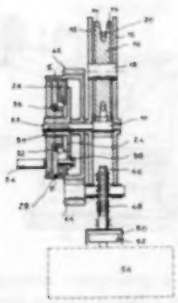
A winch or a load lifting or lowering apparatus wherein the load lowering movement is controlled by a brake device which prevents a speed of lowering higher than that determined by the rotation of a handwheel coacting with a threaded part. A bearing with tapered rollers transmits an expansion movement to brake blocks to set up friction on a brake drum.

3,640,506

POWER HOISTING APPARATUS

Marcel Durand, Grenoble, France, assignor to Jean Pomagalski S.A., Fontaine, France

Filed Mar. 24, 1970, Ser. No. 22,219
Claims priority, application France, Apr. 23, 1969, 6912933
Int. Cl. B66d 1/06
U.S. Cl. 254—187 3 Claims



A power hoisting winch having a manual operating device with a friction brake for lowering the load in case of failure of the engine or normally if the engine provides only the lifting. The manual operating device is included in the kinematic chain between the engine and the cable-operating sheave.

3,640,507

BARBED WIRE OF INCREASED TEAR RESISTANCE

Heinz Volbach, Cologne, Germany, and Oscar Julien Van Driessche, De Pinte, Belgium, assignors to Arbed S.A. Arbed-Felten & Guilleaume Vereinigte Drahtwerke, Cologne-Muelheim, Germany

Filed Apr. 24, 1970, Ser. No. 31,655
Claims priority, application Germany, Sept. 10, 1969, P 19 45 730.8
Int. Cl. E04h 17/04
U.S. Cl. 256—6 4 Claims

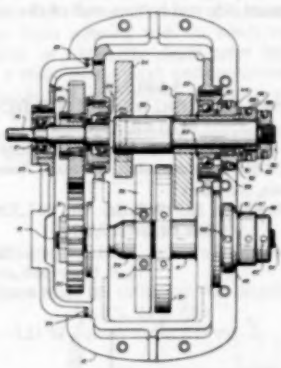
In the mounting of barbed wire as on fence posts it frequently happens that the wire is broken in the tensioning. This tensioning is generally done with a mechanical device. The difficulty is due to the fact that the wire has a very low extensibility prior to breaking. Methods of shaping the wire during manufacture are disclosed; by such shaping the extensibility is increased and the likelihood of breaking during the mounting process is decreased or eliminated.

3,640,508

VIBRATION FORCE GENERATOR

Eric A. Reibig, Waukegan, Ill., assignor to All American Tool & Mfg. Co., Skokie, Ill.

Filed June 25, 1969, Ser. No. 836,534
Int. Cl. B01f 9/00
U.S. Cl. 259—72 10 Claims



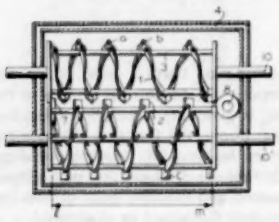
A reaction-type vibration generator which includes, generally, a housing having therein two fixed shafts which are geared together so that they rotate synchronously in opposite directions. Each of these two fixed shafts having an eccentric mass affixed to it, which mass comprises a portion one-half of the total mass rotated by that shaft. These shafts each further have a sleeve disposed concentrically about it, and these sleeves each support the other portion (one-half) of the total mass rotated by the individual shafts. The sleeves further are keyed to the shafts by means of a pair of toothed gears affixed to the shafts and to the sleeves, respectively, in a fashion such that the assembly can be easily loosened, the sleeves angularly rotatably displaced with respect to the shafts to vary the net unbalanced mass to, in turn, vary the amplitude of vibration of the vibration generator, and then fixedly keyed together again so that the masses affixed to the fixed shafts and to the sleeves rotate in synchronism. Scale

means are associated with each shaft and sleeve combination, to accurately establish the desired amplitude of vibration.

3,640,509
APPARATUS FOR CONTINUOUS REACTION OF HIGH VISCOUS MATERIALS

Seiichi Inamura; Yusuke Kondo; Minoru Akita, and Kenichi Chikanari, all of Ootsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Apr. 3, 1969, Ser. No. 813,209
Claims priority, application Japan, Apr. 6, 1968, 43/23021
Int. Cl. B01f *7/08*
U.S. Cl. 259—104 **6 Claims**

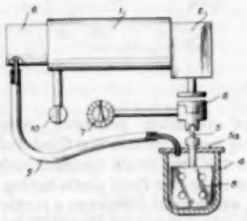


An apparatus for continuously treating a high-viscosity material. A vessel has two spiral agitating blades arranged substantially horizontally and in side-by-side relation therein. Neither has a central supporting shaft, and each has a plurality of scraping blades projecting outwardly close to the inside surface of the wall of the vessel. The agitating blades intermesh with each other when the blades are rotated in opposite directions for scraping substantially all of the viscous material on the adjacent side and bottom wall of the vessel off such wall.

3,640,510
VACUUM STIRRING DEVICE FOR DENTAL MATERIALS

Hans Lea, Frankfurt am Main, Germany, assignor to Deutsche Gold-Und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Germany

Filed Sept. 26, 1969, Ser. No. 861,326
Int. Cl. B01f *7/18*
U.S. Cl. 259—108 **1 Claim**

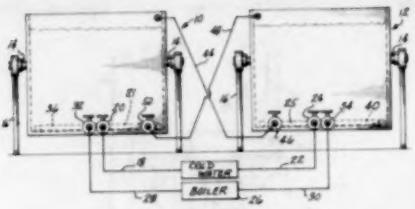


A mixing machine for materials used in dentistry where the elimination of entrained air, or air bubbles, is necessary in order to assure perfect results upon setting of the material, the machine including a closed mixing container, a rotary stirring device, and a vacuum pump for the rotary stirring device being driven by a motor by means of a magnetic clutch. A time switch is provided so that after a predetermined time of mixing the stirring device is disconnected, the vacuum pump, however, continuing to operate.

3,640,511
METHOD AND APPARATUS FOR MAKING AND PLACING LIGHTWEIGHT CONCRETE

Curtis C. Dils, Jr., 5033 119th St. S.E., Bellevue, Wash.

Filed Oct. 12, 1970, Ser. No. 79,927
Int. Cl. B28c *5/06;* **C04b** *7/00*
U.S. Cl. 259—148 **21 Claims**

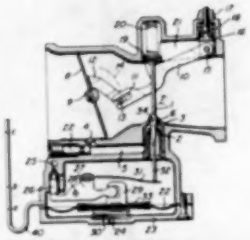


Immersing a lightweight porous aggregate for concrete in hot water in a container; then pumping cold water into the lower part of the container to displace the hot water so as to immerse the aggregate in cold water without exposure to the atmosphere, thus saturating the aggregate with water. Then removing the aggregate from the cold water and mixing it with cement, sand and water to make concrete, which is then pumped under pressure to a location for placement. An improvement being to provide two aggregate containers, and as the hot water is being displaced from the first container by the rising cold water, directing this hot water into the second container which contains aggregate and then back to the first container for another aggregate batch, thus conserving the hot water. A second embodiment being to immerse the aggregate in a steam atmosphere and then immersing it in cold water to saturate the aggregate which can then be mixed to make concrete and pumped under pressure.

3,640,512
METERINGROD CARBURETOR

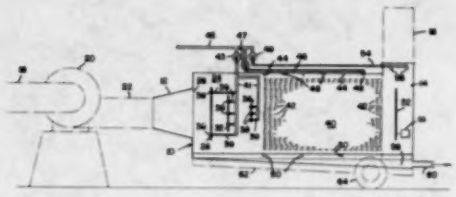
Henri Morgenroth, 3090 Hidden Valley Lane, Santa Barbara, Calif.

Filed July 14, 1969, Ser. No. 841,398
Int. Cl. F02m *51/08*
U.S. Cl. 261—34 A **11 Claims**



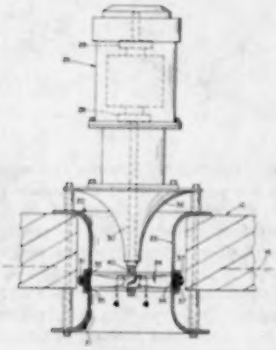
Interior discharge carburetor with a meteringrod controlling a fuel orifice (2). Throttleplate and meteringrod (1) mechanically linked by means of a thin lever (10) arranged inside the carburetor main passage. Displacement of leverpivotpoint (15), attached to body, adjusts idle position of meteringrod. Fuel mixed with bleedair and discharged into Venturi through second foam orifice, this bleedair coming from an airinlet which is subjected to a high percentage of Venturi suction at open throttle.

3,640,513
LOW VELOCITY GAS SCRUBBER
John S. Bowie, Fortuna, Calif., assignor to Bar Investment Company, Inc., Eureka, Calif.
Filed Aug. 26, 1968, Ser. No. 755,085
Int. Cl. B01d 47/06
U.S. Cl. 261—78 8 Claims



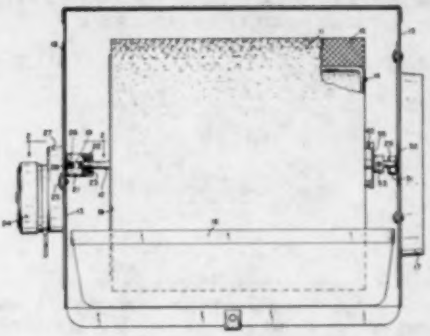
A low velocity horizontal gas scrubber in which gases to be scrubbed are led into a chamber in which there are baffles mounted across the gas flow path. The baffles have substantial orifices, with high pressure water spray nozzles mounted on the baffles spraying water counter to the flow of gases. A scrubbing unit made up of wooden slats stacked vertically and extending across the chamber in rows with sprays mounted above the slats to keep them wet occupies the balance of the chamber. A vertical baffle extending across the rear of the scrubber is vertically adjustable for equalizing gas flow through the upper and lower portions of the scrubber unit. The gases are exhausted from the unit through a stack with a water spray counter to the gas flow. A trough in the floor of the chamber collects the water and particles for discharge.

3,640,514
AERATION
George Washington Albritton, Houston, Tex., assignor to Ashbrook Corporation, Houston, Tex.
Filed Dec. 3, 1970, Ser. No. 94,803
Int. Cl. B01f 7/22
U.S. Cl. 261—91 5 Claims



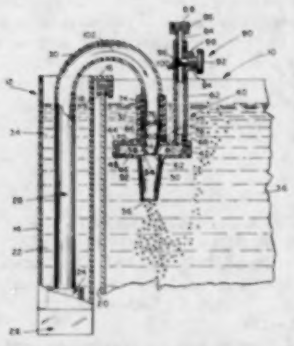
Aeration apparatus comprising a support, preferably a float having a load waterline and a cylindrical duct with a vertical axis and an interior peripheral surface, the duct providing a vertical flow passage. An impeller is mounted in the duct with its axis coincident with the axis of the duct. There are provided impeller thrust bearings supporting the impeller in the duct, preferably including a rubber bearing element positioned below the load waterline for water lubrication thereof. Such bearings include a peripheral bearing element mounted on and surrounding the impeller in cooperating thrust bearing relationship with a peripheral bearing element mounted on the interior peripheral surface of the duct. Impeller driving means are provided including a motor mounted on the support thereabove and having motor bearings supporting a drive shaft extending downwardly therefrom with its axis preferably coincident with that of the impeller and duct. For connecting the motor drive shaft and the impeller, there are provided torque transmitting coupling means permitting relative axial movement of the impeller and motor shaft, thus preventing imposition on the motor bearings of impeller induced thrust loads.

3,640,515
HUMIDIFIER DRIVE
Walter R. Stiles, Milford, Mich., assignor to Skuttle Manufacturing Company, Milford, Mich.
Filed Feb. 13, 1968, Ser. No. 705,184
Int. Cl. F24f 3/14
U.S. Cl. 261—92 13 Claims



A humidifier for a warm air heating system comprises a water pickup drum rotating with its lower sector passing through a body of water, the drum rotor being rotatably mounted on a motor-driven shaft and connected to the shaft by a slip clutch that temporarily yields to excess torque between the rotor and shaft, and the clutch comprising a toothed spring element frictionally engaging formations on the side of a hub on the rotor.

3,640,516
AERATING DEVICE
Allan H. Willinger, Rochelle, N.Y., assignor to Metaframe Corporation, Maywood, N.J.
Filed Mar. 18, 1970, Ser. No. 20,605
Int. Cl. B01f 3/04
U.S. Cl. 261—121 M 10 Claims



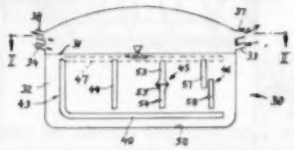
An aerating device having a sleevelike member for attaching the device to the discharge end of a filter tube sup-

plying a liquid to an aquarium tank. The liquid flows through a conical conduit positioned within an air chamber in the device to achieve a venturi effect so that the moving liquid draws the air from the air chamber, and carries the air into a conical discharge end of the device. The discharge end forces the air into the body of the liquid before the mixture of air and liquid is discharged into the aquarium liquid within the tank. A valve positioned on the device regulates the amount of the air to be supplied to the aquarium liquid. The device has a filter to purify the air being supplied and reduces any noise which may be generated by the suction action of the device.

3,640,517
METHOD AND APPARATUS FOR PROCESSING VITREOUS MELT

Alfred Sendt, Guetersloh, Germany, assignor to Hermann Heye, Obernkirchen, Germany

Filed Apr. 2, 1970, Ser. No. 25,103
Claims priority, application Germany, Apr. 3, 1969, P 19 17 450.6; July 22, 1969, P 19 37 124.5
Int. Cl. F27b *14/08*; **C03b** *5/16*
U.S. Cl. 263—11 **53 Claims**



A melt of vitreous material is heated uniformly by means of a heat tube or heat pipe, wherein circulation of a heat-exchange medium is effected independently of gravitational forces and exclusively as a function of a temperature differential existing within the heat tube. Various apparatus for accommodating and extruding melt of vitreous material are disclosed, and utilize the heat tube in different forms for controlling the temperature of the melt in desired manner.

3,640,518
BASIC REFRACTORIES

Trevor Wilkinson Lythe, Worksop, and Edward Arnold Ashworth, North Anston, both of England, assignors to Steetley (Mfg.) Ltd., Worksop, England

Filed Apr. 15, 1970, Ser. No. 28,977
Claims priority, application Great Britain, Apr. 18, 1969, 20,015/69
Int. Cl. F27d *1/04*
U.S. Cl. 263—52 **13 Claims**

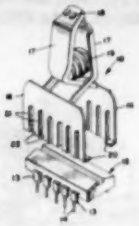
A basic refractory shape formed, for example, from dead-burned magnesia or dead-burned dolomite and having a high-carbon content is produced by heating a tar- or pitch-treated shape in the presence of vapors of a catalyst, such as an oxidation/polymerization agent, a polymerization/condensation agent or an inorganic oxidizing agent, and vapors of tar or pitch arising from the heating of the shape. The resulting shape can be fired to carbonize the tar or pitch. Impregnation with further quantities of tar or pitch subsequent to heating with the catalyst vapors is optionally effected before firing.

3,640,519
HANDLING AND HEAT-DISSIPATING DEVICE FOR ELECTRICAL COMPONENTS

William M. Halstead, P. O. Box 881, Glen Burnie, Md.

Filed Aug. 13, 1969, Ser. No. 849,831
Int. Cl. G03d *13/10*
U.S. Cl. 269—254 **6 Claims**

A pair of platelike metallic jaws are secured to a resilient clamp which urges the jaws in engagement with sets of metallic terminals at opposite sides of electrical components such as integrated circuit modules, so that when lead wires of the terminals are soldered or unsoldered, heat is dissipated by

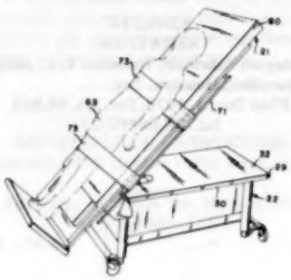


the jaws and clamp to prevent damage of the component by excessive heat. The clamp also provides a handle for the device, so that the component held between the jaws may be conveniently manipulated during installation or removal.

3,640,520
THERAPY TREATMENT TILT TABLE

Roman G. Wieland; A. John Weber; Clair A. Bearfield, and Raymond Cole, all of Valley City, N. Dak., assignors to Tri W-G Inc., Valley City, N. Dak.

Filed June 11, 1969, Ser. No. 832,280
Int. Cl. A61g *13/00*
U.S. Cl. 269—323 **5 Claims**



The invention comprises a therapy treatment table having a platform for receiving a patient and a main frame with the platform pivotally mounted to the top of the main frame, the main frame has four telescoping legs for raising and lowering the frame and platform, a motor for powering the telescoping legs, a telescoping drive member having one end pivotally connected to the main frame and the other end pivotally connected to the platform for pivoting the platform from a vertical position to a horizontal position to facilitate the placement of the patient onto the platform.

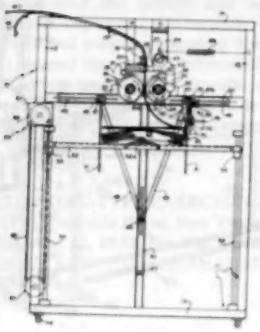
3,640,521
APPARATUS FOR STACKING FAN FOLDED PAPER

Ronald W. F. Hutley, Lansdale, Pa., assignor to Advanced Terminals, Inc., Herkimer, N.Y.

Filed Aug. 18, 1969, Ser. No. 851,012
Int. Cl. B65h *45/101*, *45/109*
U.S. Cl. 270—61 F **8 Claims**

Apparatus for receiving a continuous web of prefolded forms from a high-speed printer and stacking them refolded on a tray has brake means and feed rollers for the web, the

brake means being applied intermittently to allow the folds to refold as the forms fall to the tray. Feeler fingers continuously sense the distance from the rollers to the stack top and control the automatic lowering of the tray as the stack builds



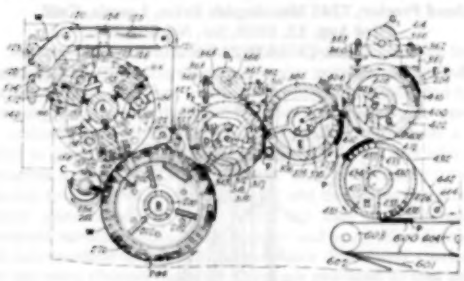
up. The feed rollers have nylon hubs and rims connected by sponge rubber cores for minimum gripping of the web whatever its thickness. A modification has continuously applied brake means and rollers with a flatted perimetrical portion for rapid intermittent feeding of web to stack.

3,640,522

SHEET FOLDING APPARATUS

Peter Oelmann, Mount Royal, Quebec, and Peter Weisshuhn, Willowdale, Ontario, both of Canada, assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 12, 1970, Ser. No. 18,947
Int. Cl. B65h *45/16*
U.S. Cl. 270—72 **36 Claims**



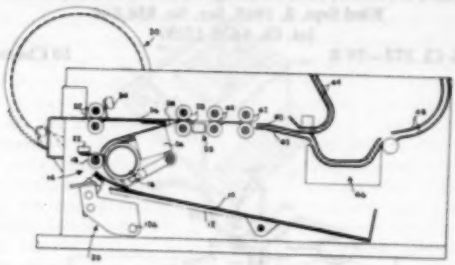
There is disclosed an apparatus for folding flexible material to form folded products such as dressings or surgical sponges at high production rate. The apparatus employs rotary drums to fold the flexible material in the longitudinal or machine direction and moving belts to fold the material in the lateral or cross machine direction. There are a number of rotary drums to cut and fold the material with transfer drums to move the material from one folding drum to the next.

3,640,523

COPY SHEET HANDLING APPARATUS FOR ELECTROSTATIC OFFICE COPIERS

Christian A. Beck, Ridgefield, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Sept. 22, 1970, Ser. No. 74,349
Int. Cl. B65h *3/10*
U.S. Cl. 271—28 **17 Claims**



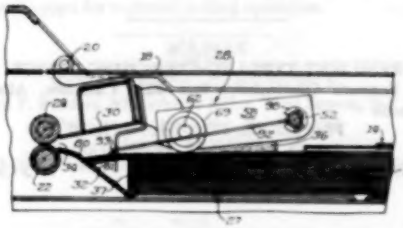
A bellows, incorporated within a sheet feed roller, is actuated by external actuating apparatus to create a partial vacuum at suction ports in the feed roller periphery. A pivotal pressure pad assembly momentarily presses a sheet stack against the ports, leaving the top sheet adhered to the feed roller which is then rotated to advance the separated top sheet to a prefeed position. Additional actuating apparatus, operating on command, rotates the feed roller through the remainder of a complete revolution to feed the prefed sheet from the apparatus and to reorient the feed roller for the next sheet separation and prefeed cycle.

3,640,524

SHEET-SEPARATING APPARATUS

Donald M. Fredrickson, Deerfield, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed June 30, 1969, Ser. No. 837,409
Int. Cl. B65h *3/06*
U.S. Cl. 271—36 **6 Claims**



This invention is directed to improved sheet-separating apparatus for enabling feeding of single sheets from a superimposed stack to adjacent sheet transport means. Desirably, single sheets are fed from the top of the stack by engagement by friction driving means. Fortuitous multiple feeds from the stack are separated by providing an inclined separating member in the path of the sheets having an irregular separating surface which cooperates with the leading edges of the fed sheets to releasably entrap them. Entrapment of the engaged sheet is overcome by the driving force of the friction driving means and only that sheet is moved past the separating member. Each of the other sheets are similarly engaged and successively moved past the separating member. The ir-

regular surface may comprise such materials as velour or pile, flock, abrasive material, or tricot fabrics.

3,640,525

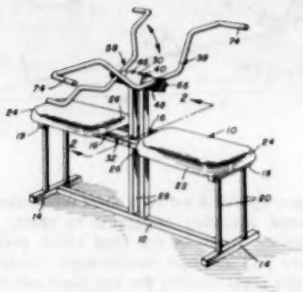
FRICTIONAL RESISTANT-TYPE EXERCISE MACHINE WITH WAIST-LEVEL-MOUNTED OSCILLATABLE HANDGRIPS

Richard I. Proctor, 7245 Morningside Drive, Loomis, Calif.

Filed Sept. 8, 1969, Ser. No. 856,040

Int. Cl. A63b *23/00*

U.S. Cl. 272—79 R **10 Claims**



An exercise apparatus including a seat structure defining front and rear portions and including a standard portion projecting upwardly from the rear portion thereof from which a generally horizontally disposed transverse handle bar including forwardly directed end portions is supported at a generally central location for oscillation about a horizontal axis extending in front-to-rear direction in a direction intersecting a user seated on the seat structure. The handle bar and its axis of oscillation are disposed at an elevation relative to the seat structure so as to generally correspond to the elevation of the waist of a person seated on the seat structure.

3,640,526

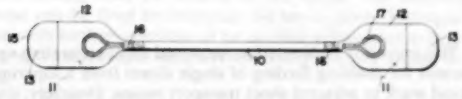
RESILIENT-TYPE LEG-EXERCISING DEVICE

John Kenneth Olorenshaw, Box 425, Canmore, Alberta, Canada

Filed Jan. 26, 1970, Ser. No. 5,670

Int. Cl. A63b *21/28, 23/04, 21/00*

U.S. Cl. 272—80 **3 Claims**



An elastic-type exercising device to be attached to the feet of a user. The exercising device has two feet-engaging members attached to the respective ends of a single elongated piece of resilient material. Two of the devices are to be positioned parallel to each other so that users may place feet in two adjacent foot-receiving members and exercise against the resistance of the other user when his feet are in adjacent feet-engaging members.

3,640,527

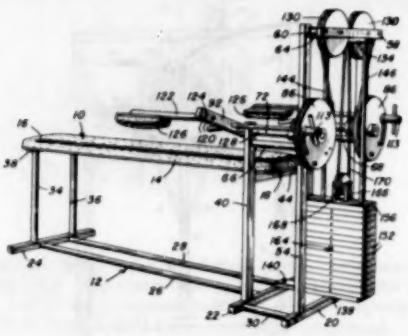
WEIGHT RESISTANT CHEST EXERCISING DEVICE

Richard I. Proctor, 7245 Morningside Drive, Loomis, Calif.

Filed July 25, 1969, Ser. No. 844,989

Int. Cl. A63b *21/00, 23/00*

U.S. Cl. 272—81 **13 Claims**



An exercising apparatus having body engaging members that are detachably fixed to offcenter locations on pulleys. The members rotate in opposite directions with respect to each other. Each pulley is connected to a cord that is reeved over another pulley and wherein said cord extends downwardly to attach to weights to be lifted. The apparatus includes a pair of pad members supported for swinging oscillatory movement about parallel axes spaced approximately shoulder width apart. The pad members are swingable between first positions with the pad members disposed on remote sides of their axes of oscillation and second positions displaced approximately 90° from the first positions thereof. The pad members are spaced outwardly of their axes of rotation approximately 5 ½ inches and are to be engaged by the inner surfaces of the forearm and upper arm spaced slightly from the elbow when the forearm is bent to form an acute angle with the upper arm. With the arms bent, they are to be engaged with the pad members and swung forwardly from oppositely extending opposite side positions forward to positions with the arms extending forwardly. The pad members are yieldingly biased toward the first positions thereof.

3,640,528

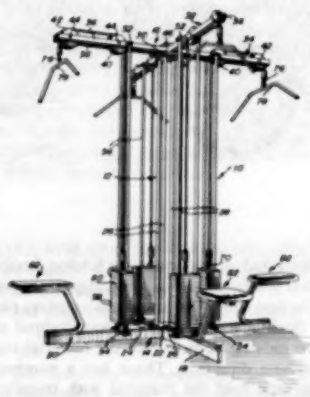
PULL-TYPE VARIABLE WEIGHT EXERCISING DEVICE

Richard Proctor, 7245 Morningside Drive, Loomis, Calif.

Filed Aug. 22, 1969, Ser. No. 852,289

Int. Cl. A63b *21/06, 23/02*

U.S. Cl. 272—81 **11 Claims**



An upright standard including four generally equally spaced, elongated base arms projecting generally radially

outwardly from the lower end thereof and four elongated support arms projecting outwardly of the upper end of the standard over the base arms. A seat is carried by the outer end of each base arm and aligned inner and outer pulleys are journaled from the inner and outer ends of each support arm for rotation about horizontal axes extending transversely of the corresponding support arm. An elongated tension member is trained over the pulleys and includes a first weighted end portion depending downwardly from the inner pulley and a second end portion depending downwardly from the outer pulley toward the seat. A horizontal handle bar is swivelly supported intermediate its opposite ends from the terminal end portion of the second end portion of the tension member for gripping by a person disposed upon the seat.

3,640,529

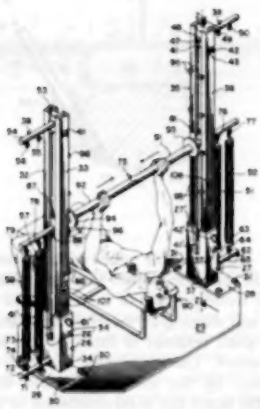
PUSH-PULL SPRING-TYPE EXERCISING DEVICE

John F. Kane, 1793 Riverside Drive, New York, N.Y.

Filed June 22, 1970, Ser. No. 48,085

Int. Cl. A63b *21/20, 23/04, 23/02*

U.S. Cl. 272—83 R **6 Claims**



An exercising apparatus for bar bell-type exercises for the development and strengthening of major portions of the body including arms and legs, in which the forces are provided by resisting springs with the same freedom that weights are used in connection with the bar bells themselves and which are used in connection with the bar bells themselves and which includes a horizontal work bar that can be vertically connected to springs at its opposite ends and the spring force resisted intermediate its ends while the user is positioned between vertical guides. Top, bottom and vertically adjustable intermediate spring arm supports are detachably carried on opposing channel supports. Parts are provided so that the arm supports can be easily adjusted or disassembled and the bar is carried in sliding bar guides adapted to be adjusted in and between space formed by opposed channel guides extending vertically and held upon the base by insertion at their lower ends into laterally-spaced sleeve supports. Knob projections are provided upon the vertical channel guides and upon the work bar are disposed sleeve disc assemblies adapted to be engage the knob projections of the vertical guides to support the bar when not being used and which can, by the user of the bar, be easily slid out of engagement with the knob projections when the bar is to be worked against the action of the springs.

3,640,530

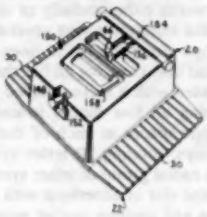
EXERCISE APPARATUS

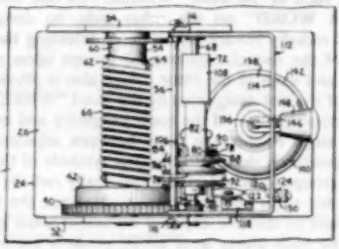
Glen E. Henson, 3510 S. Cottage, Independence, Mo., and Milton W. Fisher, Fort Lauderdale, Fla., assignors to said Henson by said Fisher

Filed Apr. 10, 1969, Ser. No. 815,052

Int. Cl. A63b *21/00*

U.S. Cl. 272—83 A **7 Claims**





An exercise apparatus comprising a pair of relatively rotatable friction members, one of which is driven from a rotatable spool through a ratchet and pawl assembly. A rope wound on the spool drives the members when the rope is pulled and a centrifugal brake clamps the members to increase the friction force responsive to the speed at which the rope is pulled. In one form, the frame is rockable against springs. A follower moves along a helical groove in the spool and carries a marker for indicating the relative force exerted on the rope during each pull. A spring windup mechanism returns the rope for repeated pulling operation.

3,640,531

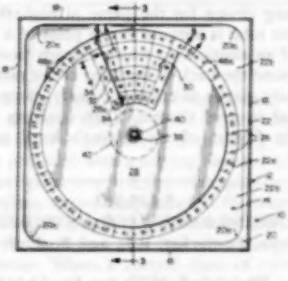
WORD FORMING GAME DEVICE

Edward F. Penders, 63 Parkside Drive, West Seneca, N.Y.

Filed Oct. 10, 1969, Ser. No. 865,437

Int. Cl. A63f *9/00*

U.S. Cl. 273—1 R **4 Claims**



A word forming game device includes a board having a playing surface and a rotor disposed thereover. The playing

surface is marked with seven concentric circles connected by 32 radial lines to form 192 segmental spaces in 32 radially disposed groups or sectors of six each and in six circumferential groups or concentric rings of 32 each. The spaces in the outermost ring severally have numerical symbols arranged in numerical sequence to designate the corresponding radial groups therebelow, while the spaces in the remaining rings severally have specific alphabetical letter symbols or a "WILD" word symbol designating any desired letter, but normally do not form words either radially or circumferentially, and the spaces in the outermost ring severally are provided with upstanding stops along the radial lines. The rotor is in the form of a circular disc covering all but the outermost ring of spaces and provided with a sector-shaped slot rotatable to expose upon stopping all five spaces in each of the radial groups, but only four spaces in each of the five concentric circumferential groups, totaling 20 letter symbols and/or "WILD" symbols. A radial group of letter symbols is provided along each side of the slot in alinement with the exposed circumferential groups and spelling one or more words radially inwardly, such as the word "WHEEL" on one side and the words "A WORD" on the other side, to designate the preferred radially inward sequence of selecting the symbols in each of the five circumferential groups upon successive rotations and stops of the rotor, which also is provided along the side of the slot designated by the word "WHEEL" with a detent extending beyond the rotor periphery and engageable with the stops to stop the rotor between adjacent pairs of stops to positively designate the first symbols of the circumferential groups to be selected sequentially radially inwardly. As the rotor stops upon successive rotations, the four symbols in each of the five exposed circumferential groups are selected by each player until all 20 symbols are selected to form words by the use of playing pieces having corresponding symbols.

3,640,532

HAND DEVICE FOR BASKETBALL PLAYERS

William W. Bauer, Box 202, Oceanside, Oreg.

Filed Feb. 4, 1970, Ser. No. 8,618

Int. Cl. A63b *69/00*

U.S. Cl. 273—1.5 A **4 Claims**

A teaching device for the game of basketball. An elongated flexible tube is secured to the palm of a player's hand by means of an elastic loop which extends from each end of the tube around the back of the hand of the player. A plurality of auxiliary elastic straps are equally spaced apart along the tube and secured thereto. Each auxiliary strap extends between the fingers of the player's hand to keep them separated.

3,640,533

REINFORCING FACING FOR A STRUNG RACKET

Tyler B. Davis, Pawtucket, R.I., and Bancroft Racket Company

Filed July 8, 1970, Ser. No. 53,167

Int. Cl. A63b *49/14*

U.S. Cl. 273—73 C **1 Claim**

A strung wooden racket having reinforcement on a portion thereof in a plane parallel to the plane of the strings. The reinforcement comprises a mesh of metal including high portions and fiberglass reinforced resin covering opposite sides of the metal mesh. The coverings are of two thicknesses: an

outer thicker covering providing a smooth surface and a thinner inner surface which allows the high portions of the metal mesh to show through and impart a rough surface. This rough surface aids the attachment to the wood racket.

3,640,534

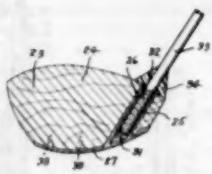
HOSEL-LESS WOODEN GOLF CLUB WITH SHAFT RETAINER AND SOLE PLATE

Truett P. Mills, 1700 Second Avenue, Tuscaloosa, Ala.

Filed June 13, 1969, Ser. No. 832,994

Int. Cl. A63b *53/02*

U.S. Cl. 273—80.7 **7 Claims**



A hosel-less wooden golf club with a combined shaft retainer and sole plate in which the usual hosel formation provided on the wood portion of the club head is eliminated, to reduce cost and shaping of the club head and a combined sole plate and shaft retainer is fitted to the underface and rear portion thereof. The club shaft is screw threaded into the shaft retainer by the use of left-hand thread. By the elimination of the hosel the wind resistance to the movement of the club is considerably lessened, the weight lies in rear of the striking face and the club is more easily balanced.

3,640,535

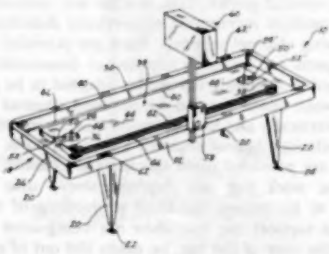
HORSESHOE GAME DEVICE WITH RECESSED STAKE AREAS

Irvin F. Gendler, Omaha, Nebr., assignor to Daniel F. Murphey, Omaha, Nebr.

Filed June 30, 1969, Ser. No. 837,473

Int. Cl. A63b *67/14*

U.S. Cl. 273—126 R **3 Claims**



A game device of the horseshoe type comprising, a supported table having an elongated flat playing surface pro-

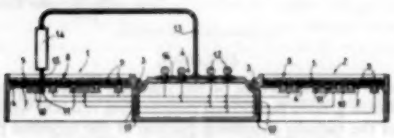
vided thereon adapted to have horseshoelike pieces slid thereon from one end to the other. A stake extends upwardly above the playing surface at each end thereof to present a scoring target for the person sliding the pieces on the playing surface. The table is provided with a gutter area extending around the playing surface adapted to receive those pieces which are improperly slid. Various embodiments are also disclosed which provide variations of the scoring target around the stakes at each end of the playing surface.

3,640,536

NAVAL COMBAT BOARD GAME APPARATUS

Laurent Godmer, "LeChambord" 2 Place Jean-Jaures, Romans, France

Filed Apr. 9, 1969, Ser. No. 814,660
Claims priority, application France, Apr. 16, 1968, 49.908
Int. Cl. A63f *3/00*
U.S. Cl. 273—130 AB **4 Claims**



A game apparatus for playing "naval combat" with electrical responses has two invertible trays with parallel and orthogonal rows of corresponding holes on both faces. The holes are intersected by contact studs. Plug-in connectors representing ships, having as many pins as the number of shots needed to sink the ships are plugged into the holes in the lower faces to provide an electrical connection with the various studs. Each plug-in connector is connectable through a flexible conductor or a printed circuit to an electric bulb of color corresponding to the class of ship. A finder is formed by a flexible cable connecting a probe and a battery to a common ground for the bulbs. When the probe inserted into an upper hole contacts a stud which is connected to a light bulb through a plug-in connector underneath, the bulb is lit. Circuit-scrambling means may be included.

3,640,537

MAGNETIC DIVINING ROD GAME EQUIPMENT

Reuben B. Klamer, 245 S. Barrington, Los Angeles, Calif., and Marshall Levy, Los Angeles, Calif., assignors to said Klamer, by said Levy

Filed Feb. 20, 1970, Ser. No. 12,907
Int. Cl. A63f *9/18*
U.S. Cl. 273—161 **7 Claims**

There is disclosed herein equipment for a game including a divining rod device, gameboard and playing cards. The divining rod device includes a handle member having pivotally attached thereto a counterbalanced arm or rod with a magnet at one end thereof. The gameboard is of laminated construction and has a metal inner layer. The playing cards have various indicia thereon and are positioned at indicated locations on the gameboard. The divining rod device is held by the handle member substantially parallel with the board and several inches thereabove. The end of the rod with the magnet is in the form of a pointer which is swept back and forth over the board until this end makes contact with a card on the board because of the attraction of the magnet to the

board. In this manner, a card is selected to thereby provide a "reading" according to the game.

ERRATUM

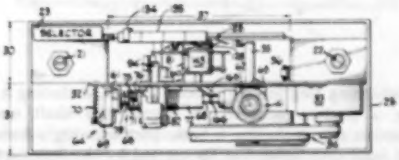
For Class 273—187 see:
Patent No. 3,639,923

3,640,538

UNIVERSAL TAPE RECORDER AND PLAYBACK INSTRUMENT

James H. Tolar, Mayfield Hgts., Ohio, assignor to Tenna Corporation

Filed June 29, 1966, Ser. No. 561,635
Int. Cl. G11b *15/00, 21/12*
U.S. Cl. 274—4 G **9 Claims**



A tape recorder and playback instrument adapted to operate with different types of tape-carrying cartridges. The instrument includes a guideway for receiving different cartridges and is provided with a sensing member which detects the type of cartridge inserted into the guideway. With one class of cartridges, means responsive to the sensing member are employed for pivoting a toggle-mounted pinch roller into position to press the tape within the cartridge against a rotating drive capstan. When a second class of cartridge is inserted, means are employed for preventing the movement of the pinch roller. In addition, a positioning mechanism responsive to the sensing member locates the transducer adjacent the desired track on the magnetic tape.

3,640,539

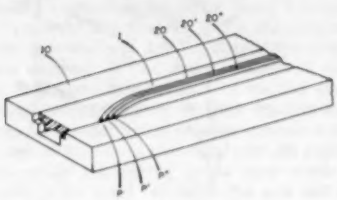
LINEAR PHONOGRAPH RECORD STRIP

Clayton H. Allen, Wellesley, and John C. Heine, Cambridge, both of Mass., assignors to Bolt Beranek and Newman Inc., Cambridge, Mass.

Original application Feb. 3, 1967, Ser. No. 613,873, now Patent No. 3,480,281. Divided and this application Sept. 3, 1969, Ser. No. 854,935

Int. Cl. G11b 3/72, 3/78

U.S. Cl. 274—42 1 Claim



Linear phonograph record strip with plural messages in parallel longitudinally extending record grooves, the grooves having starting points lying along a common line and successively spaced longitudinally of the record strip.

3,640,540

TIGHTENING RING HAVING A RIGID LINER AND AN ELASTOMERIC RING MOUNTED THEREON

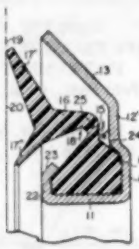
Hans Tord E. Larsson, Trelleborg, Sweden, assignor to STEFA Industri Aktiebolag, Landskrona, Sweden

Filed June 25, 1969, Ser. No. 836,306

Claims priority, application Sweden, Jan. 13, 1969, 345/69

Int. Cl. F16j 15/32

U.S. Cl. 277—25 7 Claims



A tightening ring for use around a shaft, including a liner having a portion adapted to engage the shaft and an elastomeric ring including a basic part carrying a hub part and at least one tightening lip carried by the hub part, the basic part having an inner surface which, in the tension-free state of the elastomeric ring, is inclined at an angle with respect to the axis of the tightening ring, the basic part being imbedded in the liner in a deformed condition to provide a secure connection between the liner and the elastomeric ring.

3,640,541

HYDRODYNAMIC LIFT-TYPE FACE SEAL

Ernest J. Taschenberg, Baltimore, Md., assignor to Koppers Company, Inc.

Filed June 12, 1970, Ser. No. 45,632

Int. Cl. F16j 15/34, 15/54

U.S. Cl. 277—96 6 Claims

An annular shoulder arranged to be secured to a rotating shaft has a radially extending planar seal face or surface. An annular housing member nonrotatably supports an annular seal ring and is arranged to have the rotatable shaft extend therethrough. The seal ring has a planar radially extending seal face or surface that is positioned in face-to-face relation with the rotatable seal surface on the annular shoulder. The shoulder seal surface has a plurality of separate recessed pockets arranged in spaced relation to each other. The pockets have an L-shaped configuration with an angularly extending leg. The pockets have a relatively deep recessed portion and a shallow recessed portion connected thereto and extending angularly therefrom with a step therebetween. The step is chamfered to improve the fluid lift properties of the

pockets. The seal surface on the seal ring has an annular fluid distributor groove positioned in overlying relation with a portion of the radially extending portion of the recessed pockets to receive and distribute the fluid. The seal ring seal surface has a second annular vent groove-spaced radially outwardly from the distributor groove forming a seal dam therebetween. Radial vent passages are formed in the seal ring and are connected to the vent groove. The sealing function of the seal faces is performed radially outwardly from the outer shoulder of the distributor groove and the lifting function is performed radially inwardly of the outer shoulder of the distributor groove.

3,640,542

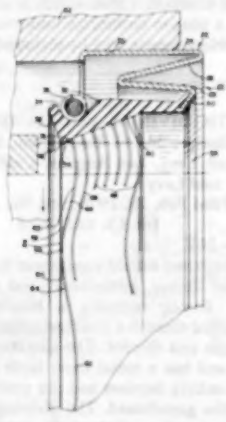
OIL SEAL WITH PUMPING ACTION

Keith B. Mowat, 186 Taylor Road, Ancaster, Ontario, Canada, and William O. Heyn, 256 Woodbine Place, Barrington, Ill.

Filed Feb. 18, 1970, Ser. No. 12,234

Int. Cl. F16j 15/32, 15/48

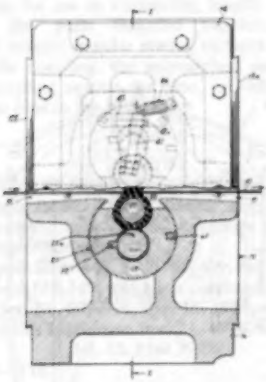
U.S. Cl. 277—134 11 Claims



An oil seal for rotating shafts and the like having a portion adapted to be received within an opening in a machine ele-

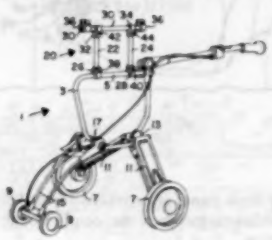
ment, and an inwardly facing flexible primary lip having portions thereof adapted to engage a part of the periphery of a shaft passing therethrough in oiltight relation. The inner surface of the primary lip resiliently but snugly engages the outer surface of an associated shaft to form a given contact area, with this portion of the lip cooperating with at least portions of one or more sinuous ribs lying on the inner surface of the primary lip, to effect a pumping action on oil trapped therebetween upon rotation of the shaft. One sinuous rib preferably has portions thereof tangent to the contact area, with the other portions of the sinuous rib being more or less closely spaced axially apart from the contact area to define therebetween a space of continuously varying axial dimension. In one embodiment, the primary lip is given its final dimension in molding, thereby predetermining the portion thereof which will form the contact area on the shaft, and in other embodiments, the final dimensioning of the primary lip occurs after molding, since the seal is trimmed to its final dimension by a subsequent operation. In the latter case, the sinuous rib may either intersect or be tangent to the contact area. The amplitude and frequency of the sinuous rib depend principally on the intended application and the material in question. In the preferred form, rib thicknesses vary as the ribs more or less closely approach the portion of the primary lip which contacts the seal.

3,640,543
SEAL FOR MOVING STRIP
George Main, Garfield Heights, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio
Filed Nov. 4, 1969, Ser. No. 874,003
Int. Cl. F16j *15/50*
U.S. Cl. 277—237 **13 Claims**



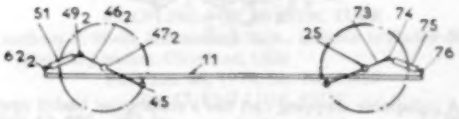
A seal for the opening of a treatment chamber for treating moving strip. An elongated roll or mounting member is pivotally mounted in a housing on each side of the opening. An elongated contact roller is rotatably mounted to each of the roll members, the contact rollers being yieldably biased toward each other through pivotal movement of the roll members so as to engage opposite sides of the strip. A backup roller is rotatably mounted in each of the roll members engaging the respective contact roller. The contact and backup rollers pivot about the axes of the roll members to accommodate strips of varying thickness and/or including nonuniformities. Seals between the elongated roll members and the housing facilitate the overall seal that is required.

3,640,544
HANDCART
Albert J. Buonassissi, 742 Lakewood Drive, Sunnyvale, Calif.
Filed June 8, 1970, Ser. No. 44,279
Int. Cl. B62b *11/00*
U.S. Cl. 280—47.35 **4 Claims**



Extension apparatus for a handcart adapted to support baggage containers, e.g., postal bags, the apparatus being adapted to be engaged to a standard cart and support containers at an elevated level relative to that of the standard cart.

3,640,545
AUTOMOBILE VEHICLE
Armand Citroen, Neuilly-sur-Seine, France, assignor to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation, Paris, France
Filed Nov. 24, 1969, Ser. No. 879,276
Claims priority, application France, Nov. 26, 1968, 175312; Nov. 15, 1969, 6939929
Int. Cl. B60g *9/02*
U.S. Cl. 280—124 **5 Claims**

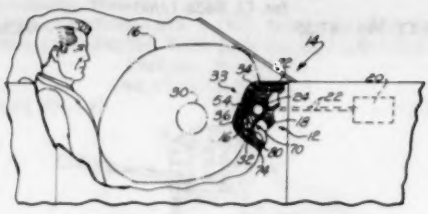


Automobile vehicle construction having a body coupled to wheels, preferably three in number, by a suspension system comprising levers rotatably mounted about the wheel axles, and members of rubberlike elasticity, acting longitudinally, the points of attachment to the body being such that the deformation of the members is substantially greater than the corresponding movement of the body.

3,640,546
SAFETY APPARATUS
Darrell S. Brawn, Livonia, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Sept. 15, 1969, Ser. No. 857,666
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **15 Claims**

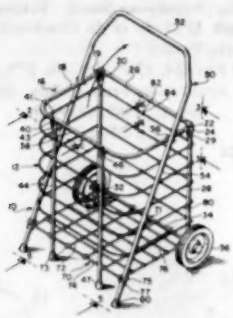
A safety apparatus for protecting an occupant of a vehicle during the occurrence of an accident includes an expandable confinement. The confinement has a collapsed inoperative

condition and an expanded operative condition for restraining movement of the occupant during the accident. A



breakaway dash panel is provided for at least in part enclosing the confinement when the confinement is in its inoperative condition.

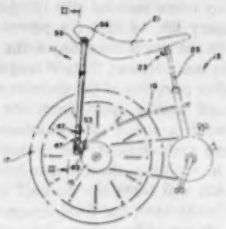
3,640,547
COLLAPSIBLE SHOPPING CART
Abraham Friedman, 1228 45th Street, Brooklyn, N.Y.
Filed Aug. 19, 1970, Ser. No. 65,107
Int. Cl. B62b *11/00*
U.S. Cl. 280—36 C **15 Claims**



A collapsible shopping cart has a rectangular basket open at the top and closed at the bottom. The top of the basket has a rigid rectangular frame pivotally secured to vertical rear post carried by an axle provided with rotatable wheels. Vertical front legs are secured to the front of the frame. A handlebar is integral with lateral legs pivotally secured to sides of the frame and slidably engaging the bottom of the basket. The sides of the basket are formed by wire ribs arranged to flex outwardly at pivot joints at one or more sides of the basket. The bottom is a wire grid rotatably secured to the axle. Ends of the wire ribs can be rigidly joined together by welding.

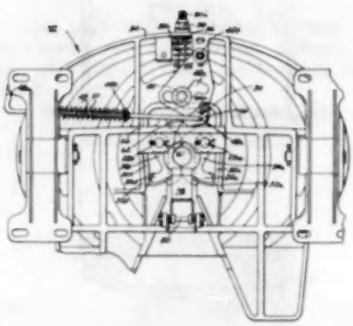
3,640,548
BICYCLE SADDLE BRACE
George W. Worley, Bolivar, Tenn., assignor to Troxel Manufacturing Company, Moscow, Tenn.
Filed July 10, 1970, Ser. No. 53,865
Int. Cl. B62j *1/00*
U.S. Cl. 280—289 **7 Claims**

A brace for supporting an elongated bicycle saddle or seat adjacent the rearward end thereof from a bicycle. The brace includes a pair of members which are attached adjacent the upper ends thereof to the saddle and adjacent the lower end thereof to a part of the bicycle. The members respectively have upper and lower portions that are substantially parallel with one another and the members have intermediate por-



tions integrally interconnecting the upper and lower portions. The intermediate portions are disposed in crossed relationship and are fastened together with fastening means to provide a rigid and stable brace.

3,640,549
NONSQUIRT FIFTH WHEEL ASSEMBLY
Charles G. Neff, Saratoga, and Louis V. Carrier, San Jose, both of Calif., assignors to Holland Hitch Company, Holland, Mich.
Filed Mar. 2, 1970, Ser. No. 15,485
Int. Cl. B62d *53/10*
U.S. Cl. 280—435 **5 Claims**

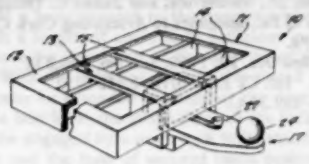


A fifth wheel assembly for a tractor-trailer connection, having a special yoke release mechanism.

3,640,550
HIDEAWAY TRAILER HITCH
Herbert Irvin Pearson, 303 Pineland Drive, Goldsboro, N.C.
Filed May 25, 1970, Ser. No. 39,961
Int. Cl. B60d *1/06*
U.S. Cl. 280—491 B **3 Claims**

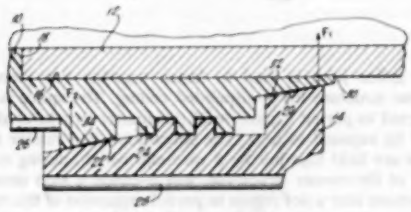
A trailer hitch secureable to a rear part of an automobile, the hitch including a tongue which extends rearwardly into

an exposed position when in use, and which is pivotable into



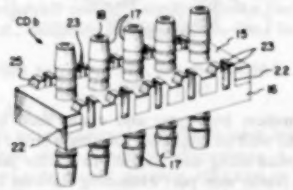
a hidden position when not in use, thereby not detracting from the appearance of the automobile.

3,640,551
COUPLING FOR PLASTIC PIPE
Leonard Shakesby, Alexandria, Ontario, Canada, assignor to Esso Research and Engineering Co.
Filed Oct. 1, 1970, Ser. No. 77,398
Int. Cl. F16l *19/00, 47/00*
U.S. Cl. 285—39 **5 Claims**



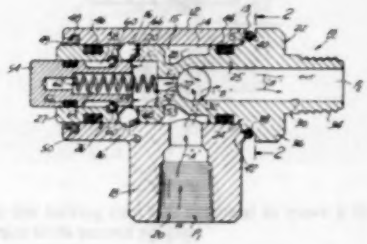
A coupling for use in connecting lengths of plastic pipe comprising two parts threaded together, which have mismatched beveled annular mating surfaces. During the assembly of the coupling, the mismatched surfaces coact to force the coupling against the pipe, providing an effective joining of the pipe to the coupling.

3,640,552
VACUUM OR PRESSURE COUPLING DEVICES
Henry William Demler, Sr., Lebanon, and Edward Landis Weist, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Original application Aug. 13, 1969, Ser. No. 858,241, now Patent No. 3,588,149, which is a continuation-in-part of application Ser. No. 690,896, Dec. 15, 1967, now abandoned. Divided and this application Dec. 21, 1970, Ser. No. 99,858
Int. Cl. F16l *39/00*
U.S. Cl. 285—110 **4 Claims**



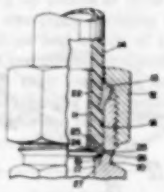
A vacuum or pressure coupling device comprises mateable body members each provided with means for connection to tubular members and each provided with means for maintaining the body members in engagement, one of the body members being provided with a stiffly flexible sealing member which is sealingly and telescopically mateable with a section of another of the body members.

3,640,553
SHIELDED AIRHOSE SWIVEL WITH SAFETY PUSHBUTTON DISCONNECT
Leland F. Blatt, 790 Shoreham, Grosse Pointe Woods, Mich.
Filed July 30, 1970, Ser. No. 59,522
Int. Cl. F16r *37/00*
U.S. Cl. 285—277 **6 Claims**



A swivel assembly for fluid conduits with a pushbutton disconnect which includes a body member having a stem member seated therein and both members are connected to fluid conduits, retaining balls seated in the stem for retaining the stem member in the body member, and a spring-biased pushbutton operatively seated in a bore of said stem member whereby the pushbutton is depressed, the retaining balls fall into a nonoperative position, thus freeing the stem member for removal from the body member; and a fluid passage is provided in the stem member for passage of fluid into the pushbutton bore to prevent release of the button when fluid pressure exists in the swivel assembly.

3,640,554
COUPLING FOR PLASTIC TUBE
Anthony F. Siwik, Kalamazoo, Mich., assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Jan. 26, 1970, Ser. No. 5,480
Int. Cl. F16l *13/14, 33/20*
U.S. Cl. 285—382.2 **2 Claims**



A body assembly for a coupling for plastic tube in which the body assembly comprises a body having a sleeve permanently assembled thereto by indentation of a portion of the sleeve in the wall of a bore in the body.

3,640,555

CONNECTOR FOR HANDTOOL SUSPENSION SYSTEM

Herbert A. Raschke, Greenbrae, Calif., assignor to E. D. Bullard Company, Sausalito, Calif.

Filed Oct. 24, 1969, Ser. No. 869,223
Int. Cl. F16b 7/00
U.S. Cl. 287—103 A 4 Claims

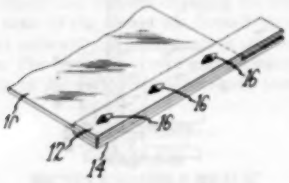
A coupling or connector is inserted as a segment of a tensively loaded support system for supporting the weight of heavy portable handtools. The coupling includes a male connector member and a female connector member which can be moved into and out of registry with one another in a first angular relation and locked together in a second angular relation to permit the coupling to transmit tensive loadings therethrough. The coupling members are completely removable from the handtool when uncoupled. Further, provision is made to securely lock the male and female connector members together to prevent inadvertent connector uncoupling when tensive loadings on the support system are rapidly changed during movement of the tool.

3,640,556

TAB WELDED JOINT AND METHOD OF MAKING

Moreland P. Bennett, 45 Concord Parkway, Pittsfield, Mass.

Original application Feb. 17, 1967, Ser. No. 616,945. Divided and this application Aug. 22, 1969, Ser. No. 868,259
Int. Cl. F16b 5/07, 5/08
U.S. Cl. 287—189.36B 6 Claims



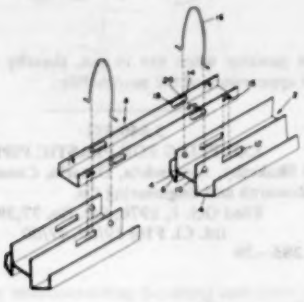
A welded joint comprising overlapped strips of metal with tabs formed by piercing or lancing through the overlapped portion. The formed tabs are flattened against the metal and resistance spot welded to such metal. The resistance welding forms a metallurgical bond between the metal members.

3,640,557

EXPANSION SPLICE

Ernest B. Nute, Jr., Mountville, and James C. Ollinger, Lancaster, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 19, 1969, Ser. No. 886,532
Int. Cl. E04c 5/18; E04b 5/52
U.S. Cl. 287—189.36A 3 Claims



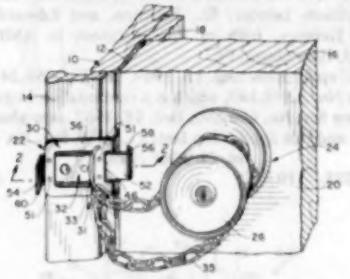
A splice joint is used to fasten together two pieces of runner structure for a suspended ceiling. The splice is constructed to permit expansion of the runner structures should they be exposed to heat. The splice joint and runner structures are held together by a wire clip which, during expansion of the runner structures, will override a stop structure and move into a slot region to permit expansion of the runner structure.

3,640,558

AUXILIARY LOCK FOR SWINGING DOORS

Harry R. Gewertz, Whittier, and George D. Read, Glendora, both of Calif., assignors to Ajax Hardware Manufacturing Corp., City of Industry, Calif.

Filed Oct. 5, 1970, Ser. No. 78,051
Int. Cl. E05c 17/36, 19/18
U.S. Cl. 292—264 10 Claims



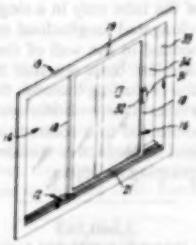
A combination bolt type and chain lock having an L-shaped frame with an edge part forming a strike plate and extending flatwise along and secured to a door jamb edge surface with a frame side part extending flatwise longitudinally along a door jamb side surface. A bolt opening is formed longitudinally through the juncture between the frame edge and side parts and the frame side part has longitudinally spaced overlying portions, with spaced protuberances acting as guide means for a sheetlike lock bolt, and is separated by intermediate underlying portions longitudinally slidably mounting the lock bolt movable through the frame bolt opening. The

lock bolt is provided with spaced protuberances to act as abutment stops for the full open and locked positions thereof. Additional locking means is provided by the combination of a hasp secured to the overlying portions of said frame with a length of chain links sufficient in length to be looped around a doorknob of the door when in the closed position. With the swinging door in the closed position, the lock bolt may be extended overlapping the door side surface acting as a bolt lock, the strike plate of the lock frame edge part may be engaged by a main lock bolt extending from the door edge and the loop of secured chain positioned around the doorknob as an additional locking feature. Disengagement of the bolt lock allows partial opening of the door to the extent of the chain loop.

3,640,559
SECURITY DEVICE FOR SLIDING WINDOWS AND DOORS

James M. Royer, 1634 Huntington Drive, Roseville, Calif.

Filed Feb. 16, 1970, Ser. No. 11,699
Int. Cl. E05c *19/18*; **E06b** *3/00*; **E05d** *13/06*
U.S. Cl. 292—288 **3 Claims**



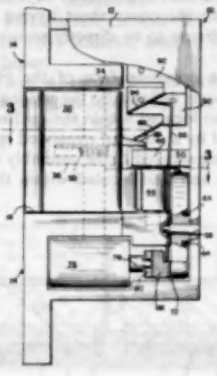
An elongated arcuate bar about 2 to 5 inches in length is provided along its bottom edge with at least one pair of transverse, spaced, parallel slots aligned on a chord of a segment of the arc to fit over one of the vertical walls of a track carrying a sliding window or door. A portion of the bar spanning the slots projects into the track into interfering relation with the adjacent corner of the window or door and prevents further movement in the direction of the stop. Clip members on top of the window or door preclude lifting movement of the window or door and removal thereof from the track.

3,640,560
ELECTRIC LATCH STRIKE

George Z. Zawadzki, and Maksimiljan Godec, both of Indianapolis, Ind., assignors to Von Duprin, Inc., Indianapolis, Ind.

Filed Aug. 19, 1970, Ser. No. 64,961
Int. Cl. E05c *11/00*
U.S. Cl. 292—341.16 **9 Claims**

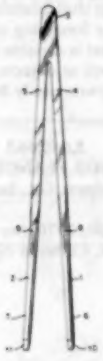
For use with a conventional retractable latch bolt, an electrically operated strike assembly comprising a strike lip movable between its closed position effective to block the latch bolt and its open position, solenoid means, a locking cam or locking member movable between a first position corresponding to the closed and locked condition of the lip and a second position corresponding to the unlocked condition of the lip, and cam means drivingly connected to the lip to be moved thereby when the lip moves from its closed condition to its open condition. The locking cam is effective to prevent movement of the said cam means by the lip when the locking cam is in its first position. The solenoid is operatively connected to the locking cam and arranged to move it from its first position to its second position.



3,640,561
CHOPSTICK DEVICE

Patrick Raymond Law, 114-116 Macdonnell Road, Apt. 502, Victoria, Hong Kong

Filed Dec. 16, 1969, Ser. No. 883,895
Int. Cl. B65g *7/00*
U.S. Cl. 294—16 **1 Claim**



A device for picking up pieces of food for transfer to the mouth consists of a one-piece molding of resilient plastic material including a base and a pair of elongated members connected to the base and extending therefrom at an angle to one another such that their free ends are normally in opposed spaced relation, whereby said members may be flexed by finger pressure to move the free ends towards one another to grip and pick up pieces of food.

3,640,562
FLEXIBLE VACUUM LIFTER

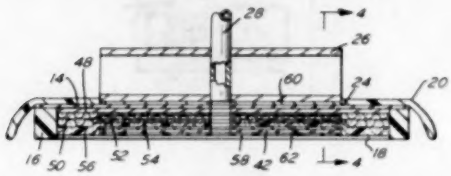
Jacob J. Creskoff, Wynnewood, Pa., assignor to Vacuum Concrete Corporation of America, Philadelphia, Pa.

Filed Mar. 17, 1970, Ser. No. 20,280
Int. Cl. F16b *47/00*
U.S. Cl. 294—65 **10 Claims**

A flexible vacuum lifter which comprises a flexible elongated frame having a deformable resilient gasket secured to

peripheral areas of one of the faces of the flexible lifter in order to define an enclosure. In the preferred embodiment of the invention the flexible lifter is backed with a cover sheet having a peripheral skirt that extends beyond the edges of the flexible lifter, with the cover sheet having an opening that permits a lifting frame to be directly secured to the flexible lifter.

Secured to the opposing face of the lifter and located within the enclosure defined by the sealing gasket is an assembly sheet. Also located within the enclosure are a pair of screens separated by a piece of expanded metal, with one of these screens being secured to the assembly sheet. Secured to the other screen and also located within the enclosure is a



perforate sheet, and finally there is a stud assembly which is the structural component most remote from the cover sheet, but is also located within the enclosure.

A vacuum pipe passes through the lifting frame and is in good fluid or vacuum communication with the other components of the invention which have appropriate coinciding openings that terminate within the enclosure at approximately the level of the outer surface of the sealing gasket, with the outermost opening being located in a neoprene strip that is secured outwardly of the stud assembly.

It will be seen that the foregoing construction constitutes a flexible vacuum lifter that is capable of lifting objects of varying size and shape, as well as objects, like sheet metal for airplane wings that is otherwise easily deformed.

3,640,563

CARRIER FOR FLANGED ARTICLE

Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation

Filed Oct. 30, 1970, Ser. No. 85,431
Int. Cl. B65d *69/00*
U.S. Cl. 294—87.2 **5 Claims**

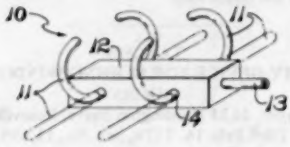
A carrier for elongated flanged articles comprises an elongated tubular structure formed from a single rectangular blank and folded along transverse fold lines so as to form a generally rectangular exterior tubular structure inside of which a pair of upwardly converging support panels are disposed, the support panels being foldably joined to each other along their top edges and being hingedly secured to the interior of the sidewalls and a plurality of aligned apertures being formed in the top and bottom panels and in the support panels, the apertures in the support panels being disposed astride the fold line therebetween.

3,640,564

FLUID-OPERATED ACTUATOR

Howard L. Kuster, Stow, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Jan. 13, 1971, Ser. No. 106,061
Int. Cl. B25b *11/00*; **B66c** *1/42*
U.S. Cl. 294—99 R **7 Claims**



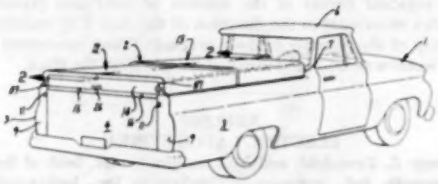
An actuator comprising a flexible elastomeric tube, which curls when one end is closed and the other end is connected to a fluid pressure source and has a uniplanarly flexible member provided in the bore of the tube and disposed so as to permit flexing of the tube only in a single plane. The tube preferably has an elongated longitudinal member of inextensible material embedded in the wall of the tube so as to extend transversely for less than one-half the tube periphery and so that the plane of curling includes the flexible member and the tension member. One embodiment includes a plurality of such tubes connected to a common manifold such that each tube curls about its respective tension member toward a central region for grasping an object.

3,640,565

TELESCOPIC COVER ASSEMBLY FOR OPEN BED VEHICLES AND LATCH ASSEMBLY FOR USE THEREWITH

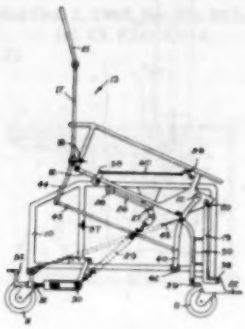
Edwin G. Anderson, 804 Northey Drive, Sacramento, Calif.

Continuation-in-part of application Ser. No. 815,309, Apr. 11, 1969, now Patent No. 3,578,378. This application Feb. 5, 1970, Ser. No. 8,864
Int. Cl. B60j *7/10*
U.S. Cl. 296—137 B **26 Claims**



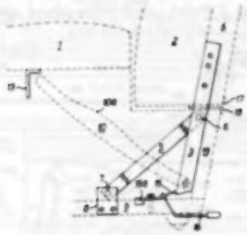
A telescopic cover assembly for open bed vehicles comprising a plurality of cover segments at least one of which is longitudinally movable relative to another. The movable segment carries wheel assemblies engageable with a pair of guide rails along which the segment is movable. Means are included for selectively elevating and lowering the movable segment during movement between extended and retracted positions. Detents are provided in which portions of the wheel assemblies are engageable for maintaining the movable cover segment in predetermined locations. Improved latch means also are provided for holding open a pivotal gate closure mounted at one end of the cover assembly.

3,640,566
INVALID CHAIR
George Alwyn Hodge, Port Lincoln, South Australia, assignor to Hodge Investments Pty. Ltd. and Hodge Distributors Pty. Ltd., Port Lincoln, South Australia
Filed Oct. 7, 1969, Ser. No. 864,424
Claims priority, application Australia, Oct. 11, 1968, 44,652/68
Int. Cl. A47c *1/02*; A61g *15/00, 7/06*
U.S. Cl. 297—68 6 Claims



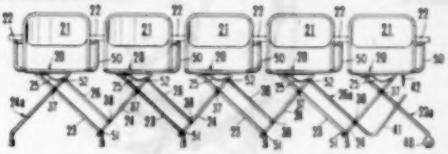
An invalid chair having a seat back hinged to the back of the seat and a lower frame hinged to the front of the seat to form an extensible assembly which is pivoted to a main support frame, the seat being spring loaded in a direction to extend the assembly of frames so that an invalid is assisted from the seat on to his feet, the assembly also being positionable in a recumbent position so that the chair functions as a bed.

3,640,567
DROP-END SEAT MECHANISM
Robin Howland, High Wycombe, England, assignor to Parker-Knoll Limited, High Wycomb, Buckinghamshire, England
Filed July 11, 1969, Ser. No. 840,981
Claims priority, application Great Britain, July 11, 1968, 33,123/68
Int. Cl. A47c *17/12*
U.S. Cl. 297—116 3 Claims



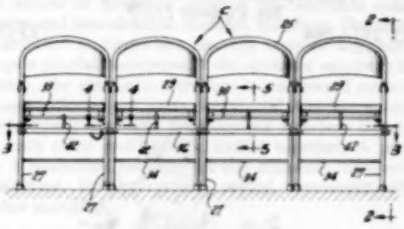
The invention concerns a drop-end mechanism for chairs and settees, particularly fully upholstered articles. The mechanism comprises an extension member fitted to the frame of the drop-end, a stay pivotally connected between the extension member and the frame of the chair and a cam track to guide the end of the extension member as the drop-end is raised and lowered. A particular feature of the invention is that as the drop-end is lowered it moves inwardly relative to the seat to prevent any gap between the seat and drop-end upholstery when in the dropped position. The drop-end is supported from below and, in a preferred arrangement, can be set in an intermediate position.

3,640,568
FOLDABLE CHAIR SET
Toshio Suzuki, and Toyo Kaneko, both of 5-16, Shimane 4-chome, Tokyo, Japan
Filed Aug. 6, 1969, Ser. No. 848,022
Claims priority, application Japan, Sept. 26, 1968, 43/69347
Int. Cl. A47c *15/00*
U.S. Cl. 297—232 5 Claims



A foldable chair set comprising a plurality of chairs secured together in foldable relation having a pantograph type of linkage which will fold to provide for compact storage; a further feature of the invention is the provision of wheels on the leg toward which the folding occurs to facilitate transportation of the set.

3,640,569
CHAIR COUPLING DEVICE
Feramorz H. Young, 393 Auburn Lane, Sierra Madre, Calif.
Filed June 16, 1969, Ser. No. 833,311
Int. Cl. A47c *15/00*
U.S. Cl. 297—248 4 Claims

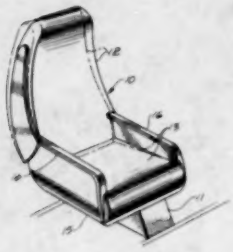


Multiple like chairs are coupled together in row alignment by an elongated locking bar mountable horizontally proximate the chair legs, the bar carrying holder means forming recesses opening lengthwise of the bar and at spaced locations therealong so that when the bar is shifted longitudinally the recesses closely receive the chair legs, and the bar being vertically supported by spaced hangers. Means also is provided for releasably retaining the bar against shifting from chair retaining position.

3,640,570
SEAT FOR RECLINING CHAIR
Ashjorn Karlsen, Pacific Palisades, Calif., assignor to Hardman Aerospace, Los Angeles, Calif.
Filed June 19, 1970, Ser. No. 44,920
Int. Cl. A47c *1/02*
U.S. Cl. 297—316 12 Claims

A reclining aircraft chair or the like having an articulatable seat portion providing full leg support for maximum comfort is described. The chairback pivots about an axis substantially

in line with the hip joints of a person occupying the chair, and when the chairback pivots from an erect position to a reclined position the rear part of the seat portion drops to better fit a person's contour. The front edge of the seat does not move and the seat articulates approximately about its middle to provide proper cradling of the chair occupant. To provide such motion, the seat portion is divided into a U-shaped seat pan, pivotally connected to the chairback so as



to lower therewith, and a leg frame pivotally connected to the forward part of the seat pan and also to the fixed front of the seat. Resilient straps between the back of the pan and the fixed seat front are interwoven with transverse straps between sides of the seat pan and between sides of the leg frame. The resilient straps across the leg frame provide augmented leg support for optimum passenger comfort in both the erect and reclined positions.

3,640,571

TRUNK SUPPORT FOR SITTING PATIENTS

Michael Keropian, 3870 California Street, Apt. 4, San Francisco, Calif.

Filed Sept. 12, 1969, Ser. No. 857,431

Int. Cl. B60r *21/10*

U.S. Cl. 297—384 **13 Claims**

A trunk support for use with wheelchairs and the like having contoured trunk support plates disposed laterally of and in supporting contact with the patient's trunk. The plates are secured to the backrest of the chair, are universally movable for adjustment to the patient's size and shape, and are locked in the supporting position. The plates can be opened to permit the patient to enter or alight from the chair. Stop means are provided so that each time the plates are moved into their trunk supporting position they return to an identical, predetermined position to thereby eliminate the need for adjustments of the plate while used with the same patient.

3,640,572

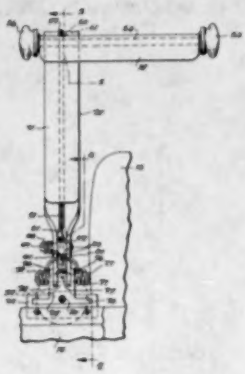
VEHICLE SAFETY GUARD

Emil J. Doehler, 58 Dundee Street, Buffalo, N.Y.

Filed Dec. 16, 1969, Ser. No. 885,424

Int. Cl. A62b *35/00*

U.S. Cl. 297—390 **5 Claims**



This disclosure is of a restraining device or support for holding a person in a seat in a vehicle in case of accident, causing sudden stop of forward motion of the vehicle. The support is so mounted that it is easily positioned in supporting relation to the front of the person when seated and also easily swung upwardly into an inoperative position and does not require attachment to the person.

3,640,573

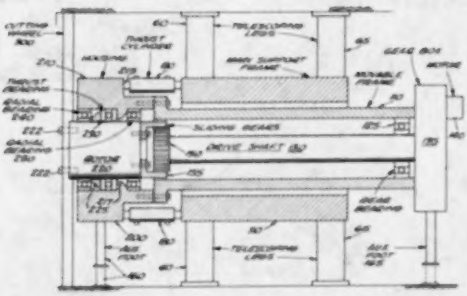
TUNNELING MACHINE

Frank Safar, Fullerton, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Oct. 6, 1969, Ser. No. 863,783

Int. Cl. E01g *3/04*

U.S. Cl. 299—31 **17 Claims**



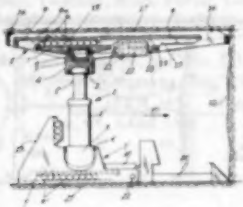
A tunneling machine having a main support frame and also a movable frame which is longitudinally movable in stepwise fashion as the tunnel is being drilled, in which a main bearing assembly is utilized for transmitting both forward thrust and rotating drive to a cutting wheel, the main bearing assembly having a stator (housing) to which forward thrust is imparted by separate forward thrust drive means, the stator being attached to the forward end of the movable frame for pulling it forward, the main bearing assembly also including a rotor which directly drives the cutting wheel and which receives

rotational drive through a mated pair of driving gears from the drive shaft of the machine; the rotor being supported from the stator by both radial and thrust bearings, and the pair of driving gears being longitudinally slidable so that vibration stresses from the cutting head are not transmitted back through the drive shaft to the rotating drive mechanism of the machine.

3,640,574
LONGWALL MINING APPARATUS

Hans-Joachim Von Hippel, Bergle 7771, Oberstenweiler, Germany

Filed Oct. 2, 1969, Ser. No. 863,078
Int. Cl. E21c 35/14
U.S. Cl. 299—32 10 Claims

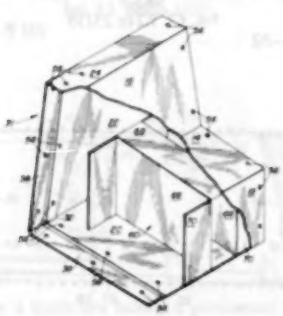


An underground excavating apparatus having a conveyor for removing material from the face of an underground excavation. The conveyor removes the material in a predetermined direction. An elongated cap is movable into engagement with the roof of the excavation above the conveyor extending transversely to the face and the direction in which the conveyor removes the material. A set of props including first props extending upwardly above the conveyor from one side thereof and of the predetermined direction, and second props extending upwardly above the conveyor from the other side of the latter and of the predetermined direction. The props are thus mutually inclined, meeting above the conveyor and engaging and maintaining the cap means in position above the conveyor.

3,640,575
ARTICLE OF FURNITURE FORMED FROM PAPERBOARD

Giovanni E. Dosi, Merate, Italy, assignor to Container Corporation of America, Chicago, Ill.

Filed July 1, 1970, Ser. No. 51,652
Claims priority, application Italy, July 17, 1969, 19746 A/69
Int. Cl. A47c 7/00
U.S. Cl. 297—440 6 Claims

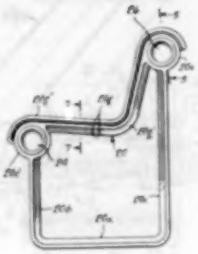


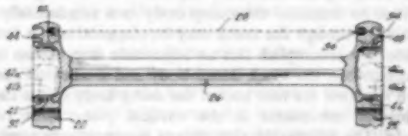
An article of furniture is formed from suitably scored and cut blanks of paperboard. The article has a main tubular portion the ends whereof are closed by separate end closure panels. Foldable flaps are hinged to the edges of the tubular structure and the closure panels. The flaps of the closure panels are releasably attached to the flaps of the tubular portion to complete the article.

3,640,576
FURNITURE CONSTRUCTION

Andrew Ivar Morrison, Brooklyn, and Bruce R. Hannah, Staten Island, both of N.Y., assignors to Art Metal-Knoll Corporation, New York, N.Y.

Filed June 8, 1970, Ser. No. 44,158
Int. Cl. A47c 4/02, 7/20, 7/14
U.S. Cl. 297—440 9 Claims



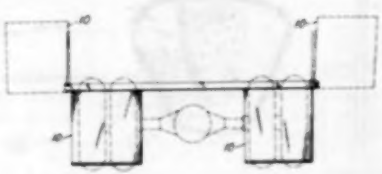


An article of furniture utilizing two identical sidepiece members and two identical stretcher members. The sidepiece and stretcher members are laterally coupled together such that upon pivotal movement of the stretcher members in one direction, the sidepiece members move toward each other and can be disengaged, and upon pivotal stretcher movement in the opposite direction, the sidepiece members move away from each other and become locked together. A piece of fabric is positioned between the two sidepiece members and is tensioned by appropriate pivotal movement of the stretcher members.

3,640,577
RETRACTABLE MUD FLAPS FOR DUMP TRUCKS AND TRAILERS

Nolan J. Ducote, 306 Keller Street, Bunkie, La.

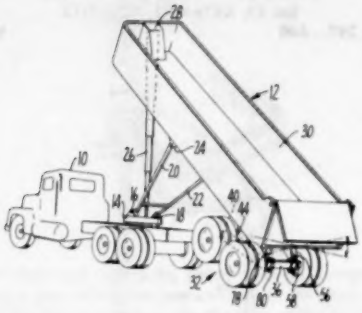
Filed Apr. 20, 1970, Ser. No. 29,958
Int. Cl. B62b 9/16
U.S. Cl. 298—1 SG 4 Claims



Dump trucks are provided mud flaps and means automatically activated by shifting of the load bed to move the flaps

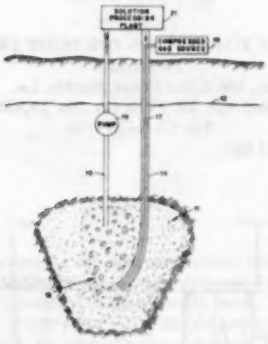
out of the way while dumping and to restore the flaps to normal position after dumping is completed.

3,640,578
LEVELLING SYSTEM FOR SEMI END DUMP TRUCKS
James Harold Finney, 150 Page Way, Fortuna, Calif.
Filed Feb. 6, 1970, Ser. No. 9,356
Int. Cl. B60p *1/16*
U.S. Cl. 298—17 S **4 Claims**



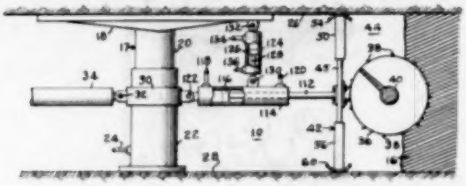
In a dump truck wherein the entire trailer chassis is lifted upon dumping automatically adjustable stabilizing means is provided to maintain the dump body in a substantially level plane even though the truck may be disposed on an inclined surface. To accomplish this an adjustable stop means is provided between the truck dump body and a wheeled carriage which supports the rear end of the dump body and is capable of angular movement in the vertical plane with respect thereto. The adjustable stop means is operatively associated with a control mechanism which automatically adjusts the stop means in accordance with the degree of inclination of the terrain surface upon which the truck is supported.

3,640,579
IN SITU PRESSURE LEACHING METHOD
Arthur E. Lewis, 844 Santa Rita Avenue, Los Altos, Calif.
Filed Apr. 28, 1970, Ser. No. 32,679
Int. Cl. E21b *43/28*
U.S. Cl. 299—4 **10 Claims**



A nuclear chimney located below the water table in a primary ore deposit serves as an in situ pressure vessel in which ore can be oxidized and a desired element contained in the ore subsequently recovered in a leach solution. After the nuclear chimney has flooded with water under substantial hydrostatic pressure, oxidizing gas is percolated through the contained ore and water mixture to dissolve and oxidize the ore minerals. Ammonia may be added with the oxidizing gas to render the solution basic. The solution is pumped from the chimney and may be recirculated with or without heating until the desired concentration is obtained. The oxidizing gas may also be heated prior to its introduction into the chimney.

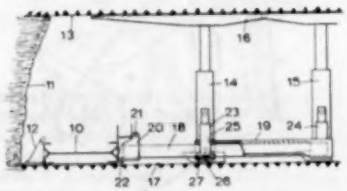
3,640,580
DUST-ELIMINATING COAL-MINING APPARATUS
Letcher T. White, 117 Wayne Street, Manchester, Ky.
Filed July 24, 1969, Ser. No. 844,269
Int. Cl. E21c *35/22*
U.S. Cl. 299—31 **11 Claims**



A coal-mining apparatus is fed against a vein of coal under pressure and advanced through the vein to progressively mine the coal. Back of the mining apparatus is arranged a board or partition which extends from the floor to the roof of the mine and combines with the floor and with the veil of coal to form a compartment. Means is provided, associated with the compartment referred to, for minimizing or eliminating light floating dust, this being done either by spraying through the air in the compartment or by exhausting air therefrom.

The invention further comprises a method of coal mining wherein the mining operation takes place in a confined space, and, during the mining operation, coal dust is constantly eliminated from said confined space.

3,640,581
IMPROVEMENTS TO ARRANGEMENTS FOR CONTROLLING THE GUIDANCE OF A MINERAL MINING PLOUGH
Christoph Rassmann, Lunen, and Willy Heyer, Bochum-Gerthe, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen, Westfalia, Germany
Filed Feb. 13, 1970, Ser. No. 11,244
Claims priority, application Germany, Feb. 20, 1969, P 19 08 483.4
Int. Cl. E21c *25/56*
U.S. Cl. 299—32 **16 Claims**



An arrangement for controlling the guidance of a mineral winning plough movable along one side of a conveyor. Control members in the form of leaf springs are disposed

between the other side of the conveyor and a roof support assembly. The leaf springs are slidably received in a tubular housing suspended from the props of the assembly by means of independently operable hydraulic piston and cylinder units. The units are connected in an articulated manner to the housing to permit the springs to assume various angular control positions.

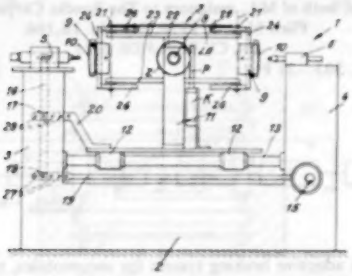
ERRATA

For Classes 299—31 and 299—32 see:
Patent Nos. 3,640,573 and 3,640,574

3,640,582
BRUSH-MAKING MACHINE

Heinz Zahoransky, Todtnau, Black Forest, Germany, assignor to Firma Anton Zahoransky, Todtnau, Black Forest, Germany

Filed Jan. 23, 1970, Ser. No. 5,302
Claims priority, application Germany, Jan. 25, 1969, P 19 03 771.9
Int. Cl. A46d *3/06*
U.S. Cl. 300—3 5 Claims

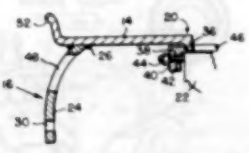


A brush-making machine comprising at least one rotatably mounted carrier member for chucking devices located on diametrically opposite sides of said carrier member, and possibly a depth compensating mechanism, said carrier member substantially having the form of a two-armed lever which carries the chucking devices at the ends of its arms.

3,640,583
DUAL WHEEL FOR TRUCKS

Ralph Gary Verbridge, Williamson, N.Y., assignor to Schovee & Boston, Rochester, N.Y., a part interest

Filed Aug. 27, 1969, Ser. No. 853,410
Int. Cl. B60b *3/02*
U.S. Cl. 301—9 DN 3 Claims

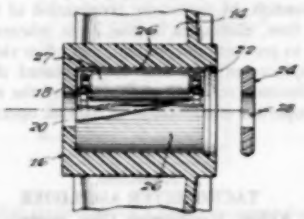


A wheel for a truck tire having a permanent first type of mounting means for attaching the wheel to a first type of truck wheel hub and also having a permanent second type of mounting means for alternatively attaching the wheel to a second type of truck wheel hub. The wheel includes a disc at one side of the wheel having a plurality of circumferentially spaced openings for receiving a plurality of circumferentially spaced bolts protruding from a disc-type hub. The wheel also includes an inwardly turned annular flange or lip at the opposite side of the wheel from the disc for attachment to a spider-type hub. The disc includes a plurality of large openings, one each corresponding to the number of bolts used when mounting the wheel by means of the lip, to accommodate a mounting tool or wrench therethrough.

3,640,584
SMALL VEHICLE WHEEL

Milton Solomon, Chicago, Ill., assignor to Circle Engineering Co., Inc., Chicago, Ill.

Filed Aug. 12, 1969, Ser. No. 849,307
Int. Cl. B60b *5/02*
U.S. Cl. 301—63 PW 16 Claims

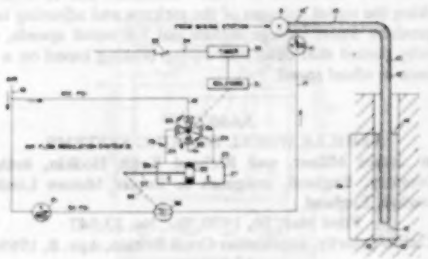


A small integral molded vehicle wheel comprising a rim, a hub and connecting support structure. A roller bearing assembly comprising a split outer race, rollers and cage structure, is disposed within the hub and a resilient retaining end cap lockingly engages the hub bore retaining the rollers and cage in proper axial alignment. An integral seal is formed with the end cap so as to prevent the ingress of dirt and foreign material. A method for making the above-described wheel comprising the steps of: injection molding the rim, connecting support structure and hub; inserting a split outer race into the bore of the hub while the injection-molded piece is still hot; and cooling the structure so as to cause the inner diameter of the hub to contract and thereby to secure the split outer race in position in the hub.

3,640,585
MAINTENANCE OF SLURRY EXPLOSIVE PUMPING ASSEMBLY FOR SUCCESSIVE LOADINGS

John F. Hamilton, Wilmington, Del., and Donald J. Pederson, St. Louis, Minn., assignors to Hercules Incorporated, Wilmington, Del.

Filed July 23, 1969, Ser. No. 844,114
Int. Cl. B65g *53/04*
U.S. Cl. 302—17 11 Claims



The invention provides method, and system, for automatically removing residual slurry explosive from a delivery con-

duit, or hose, of a slurry explosive pumping-loading assembly, after each loading, to maintain the assembly operable during a series of successive loadings.

Thus, after the loading, residual slurry explosive is evacuated from the delivery hose while the hose remains extended into the emplacement zone and into the resulting mass of emplaced explosive therein, by introducing a gas (generally air) into the hose for displacement of the residual slurry into the emplaced slurry mass, and automatically terminating introduction of said gas into the hose in response to addition of a predetermined amount of the gas sufficient for the displacement.

The system includes means for introduction of the displacement gas into the hose, and means for maintaining the gas in displacement flow; and means for terminating the gas introduction in response to addition of the predetermined displacing amount.

In preferred practice, and as specifically illustrated, the invention terminates the gas flow in response to expiration of a predetermined time required for the displacement.

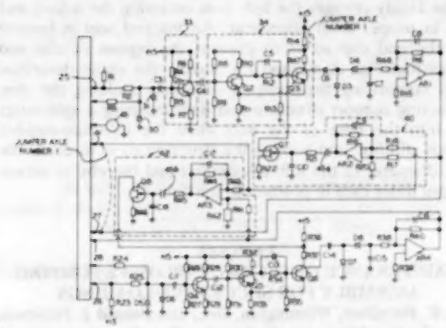
The invention, by automatic termination of the displacement gas flow, eliminates human error inherent in manual operation to prevent concomitant, and often violent, flow of excess displacement gas into the emplaced slurry and to thereby eliminate resulting impairment of the emplaced explosive properties encountered in manual operation heretofore.

3,640,586

TACHOMETER AMPLIFIER

William H. Kohler, Worthington, Ohio, assignor to Abex Corporation, New York, N.Y.

Filed Mar. 9, 1970, Ser. No. 17,595
Int. Cl. B60t *8/08, 8/10*
U.S. Cl. 303—21 R **12 Claims**



A tachometer amplifier for an antiskid brake system controlling skid conditions on a plurality of vehicle axles which includes circuitry receiving signals from a plurality of tachometer pickups, one on each wheel. The amplifier compensates for difference in wheel diameters due to wear by tracking the signal voltages of the pickups and adjusting same to produce equal voltage signals out for equal speeds, and thereby permit skid detection during braking based on a difference in wheel speed.

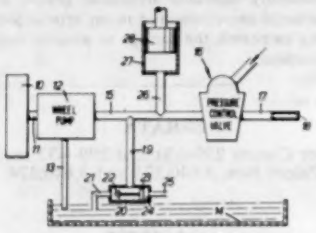
3,640,587

VEHICLE WHEEL BRAKING SYSTEMS

Peter James Milner, and Richard Keith Hodkin, both of Coventry, England, assignors to Rootes Motors Limited, London, England

Filed Mar. 30, 1970, Ser. No. 23,947
Claims priority, application Great Britain, Apr. 8, 1969, 17,840/69
Int. Cl. B60t *8/06*
U.S. Cl. 303—21 F **7 Claims**

A vehicle wheel braking system having a hydraulic pressure operated brake capsule of causing wheel slip, a positive action pump driven in synchronism with the wheel to produce hydraulic pressure for operating the brake and



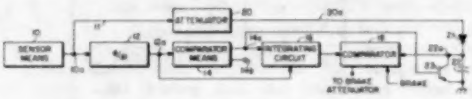
means for varying the braking effect to maintain wheel slip at a substantially constant value or within a predetermined range when maximum braking is required.

3,640,588

MEANS FOR DELAYING EFFECTIVE CONTROL OF VEHICLE BRAKING BY AN ADAPTIVE BRAKING SYSTEM UNTIL CERTAIN WHEEL VELOCITY AND DECELERATION CONDITIONS HAVE BEEN SATISFIED

Ralph W. Carp, Baltimore, and Frederick O. Miesterfeld, Jopps, both of Md., assignors to The Bendix Corporation

Filed Mar. 3, 1970, Ser. No. 16,166
Int. Cl. B60t *8/08, 8/12*
U.S. Cl. 303—21 P **14 Claims**



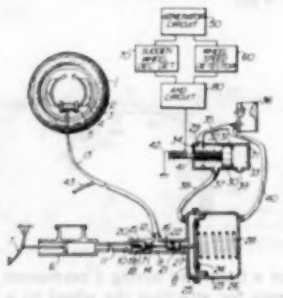
In an adaptive braking system for automobiles, trucks and the like there is provided apparatus for delaying automatic braking control of the vehicle until, after the brakes are applied, a controlled wheel attains a first level of negative acceleration (deceleration) and thereafter the time integral of wheel acceleration attains a level related to controlled wheel speed.

3,640,589

AUTOMATIC ANTISKID BRAKING SYSTEM

Koichi Taniguchi, Kariya-shi, Japan, assignor to Nippondenso Kabushiki Kaisha, Kariya-shi, Japan

Filed Dec. 30, 1969, Ser. No. 889,065
Int. Cl. B60t *8/08, 8/12*
U.S. Cl. 303—21 BE **3 Claims**



An automatic antiskid braking system including a sudden wheel deceleration detector for detecting a sudden deceleration of the wheels and which emits a first signal upon detect-

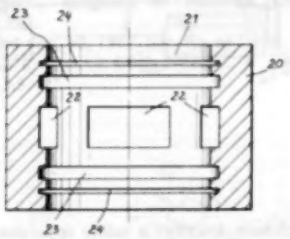
ing sudden deceleration and then maintains this first signal for a certain period of time even after the wheels have stopped rotating, a wheel speed detector for detecting the wheel speed being below a predetermined value for emitting a second signal in response thereto, an AND circuit emitting a third signal when the first and second signals from both the sudden wheel deceleration detector and the wheel speed detector are impressed thereon, and a pressure regulating mechanism for relieving brake pressure in response to the third signal from the AND circuit. A vehicle provided with such system can be stopped or decelerated within the shortest possible distance of travel on a good and relatively nonslippery road surface, while the vehicle can still be stopped and decelerated without encountering a skid condition on a slippery road surface.

3,640,590

MEANS UTILIZING COMPRESSED AIR FOR CONFINING A PRESSURIZED OIL FILM BETWEEN RELATIVELY MOVABLE BEARING SURFACES

Manfred Beisemann, Essen, Germany, assignor to P. Koning Machinefabriek, Swalmen, Netherlands

Filed Aug. 12, 1969, Ser. No. 849,369
Claims priority, application Germany, Aug. 13, 1968, P 17 75 454.0; Nov. 16, 1968, P 18 09 350.0
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 **10 Claims**



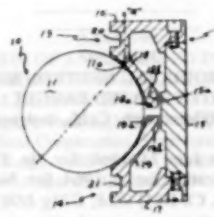
A pressurized oil film is built up in a region between relatively movable bearing surfaces by means including a pressurized oil supply line and an oil return line. Compressed air is caused to impinge on the edges of the oil film region to provide a pneumatic pressure threshold for confining the extent of the region and preventing leakage of the oil.

3,640,591

ROLLING CONTACT BEARING HAVING TEMPERATURE COMPENSATION

Phillip R. Eklund, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed Mar. 4, 1970, Ser. No. 16,510
Int. Cl. F16c *27/00*
U.S. Cl. 308—184 **3 Claims**



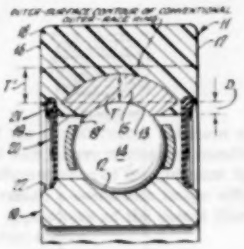
A bearing assembly including a rolling contact bearing member, and a raceway structure incorporating a temperature-compensating flexure-type rib arrangement for providing immediate bearing support to, and resiliently resisting excessive thermal expansion of, the bearing member to thereby counteract and inhibit spalling of the bearing components normally resulting from the excessive thermal expansion.

3,640,592

ANTIFRICTION BEARING WITH EMBEDDED RACE INSERTS

Ralph S. Howe, Jr., New Britain, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Oct. 23, 1969, Ser. No. 868,736
Int. Cl. F16c *33/00*
U.S. Cl. 308—193 **4 Claims**



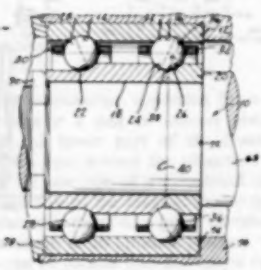
The invention contemplates a major economy in the metal required for manufacture of an antifriction bearing ring, such as the outer race ring of a ball bearing, said economy being realized without loss of integrity of the race or its radial-load capability, as compared with a conventional all-metal race ring construction of equivalent capacity. Economy is realized by forming an insert from a cylindrical annulus of a deformable and hardenable material, such as ductile steel, the deformation being to create a ring of substantially uniform thickness but continuously concaved, at one of the inner and outer surfaces, to define the raceway contour. The deformation is to an extent producing a concave surface of depth exceeding the desired ultimate raceway depth. The deformed ring is hardened and then embedded in a body molding of plastic or elastomeric material, depending on ultimate use requirements. Race finishing, including the step of removing excess insert metal to create the desired raceway depth, can proceed before or after molding.

3,640,593

DOUBLE ROW BEARING

Lewis W. McKee, Brookfield, Conn., and Robert H. Feest, Jr., Juno Beach, Fla., assignors to The Borden Corporation, Danbury, Conn.

Filed Oct. 7, 1969, Ser. No. 867,429
Int. Cl. F16c *33/60*
U.S. Cl. 308—196 **6 Claims**



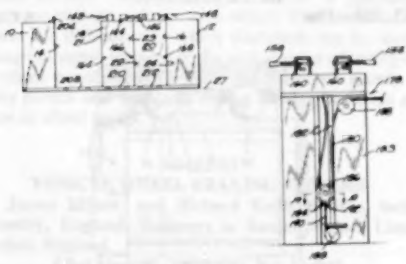
An improved double-row bearing in which two pairs of ball-receiving raceways comprise a first pair of deep groove-

bearing raceways, one of which is formed in a unitary ring which also provides a raceway of the other pair, and the other of which is formed by two ring sections, one of which provides the other raceway of the other pair, the other pair and its rolling elements making up an angular-contact bearing.

3,640,594
BEARING RETAINER CONSTRUCTION
Edwin Aho, Center Line, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.
Filed Mar. 9, 1970, Ser. No. 17,741
Int. Cl. F16c *33/34*
U.S. Cl. 308—212 **7 Claims**

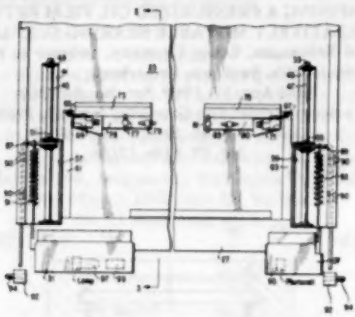
A roller bearing cage or retainer having pockets with pads provided to permit the rollers to be snapped into the pockets and past the pads with the pads having seats cooperating to hold the rollers in place and with the pads formed by a method whereby the location of the seats can easily be determined.

3,640,595
MOTORIZED MOBILE SHELVING UNITS
Maurice F. Staller, and Marvin A. Staller, both of Fort Atkinson, Wis., assignors to Staller Cabinet, Inc., Fort Atkinson, Wis.
Filed May 6, 1970, Ser. No. 35,214
Int. Cl. A47b *53/00, 77/00, 87/00*
U.S. Cl. 312—198 **16 Claims**



Storage apparatus which includes one or more mobile storage or shelving units moveable on guide tracks employs reversible electric motors in each mobile unit to move the units to open the desired access aisle. Direction-control switches located on the exposed ends of the mobile units and right and left limit switches on each of the mobile units afford selective energization of the motors to open the desired aisle.

3,640,596
SAFETY APPARATUS FOR MECHANICAL FILING CABINETS
Roy Edwin Kanitz, Belpre, Ohio, assignor to Sperry Rand Corporation, New York, N.Y.
Filed Dec. 10, 1969, Ser. No. 883,690
Int. Cl. A47b *77/08, 81/00*
U.S. Cl. 312—223 **6 Claims**



This disclosure describes a safety apparatus for use in a mechanized filing cabinet. A lower bar having a lamp at one end and a photocell at the other end is attached by springs to the rear of the posting board of the filing cabinet. An upper bar also having a lamp at one end and a photocell at the other end is attached by springs to the bottom of the closure door of the filing cabinet. When either of the photocell beams is broken, the motor that moves the trays of the filing cabinet is deenergized. In addition, when the door is closed, the upper bar impinges on rubber stops causing the upper bar to move upwardly. The upward movement of the upper bar opens microswitches which are also connected to deenergize the tray movement motor.

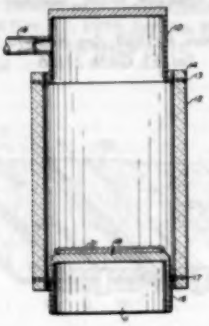
ERRATUM

For Class 316—28 see:
Patent No. 3,641,391

3,640,597
METHOD OF PRODUCING NEUTRON SOURCE TUBE WITH COATED TARGET
Lowell A. Noble, Hillsborough, Calif., assignor to Varian Associates
Original application June 21, 1960, Ser. No. 371,803. Divided and this application Jan. 6, 1964, Ser. No. 336,075
Int. Cl. H01j *9/38;* **G21g** *3/04*
U.S. Cl. 316—10 **4 Claims**

A method of making an active metal target for a neutron source tube. Deuterium or tritium gas is sorbed into the active metal. The target is then heated and reacted with a coat-

ing gas to form a protective coating over the target which



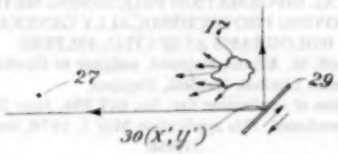
prevents desorbtion of the deuterium or tritium during operation of the tube.

3,640,598

TECHNIQUE OF HOLOGRAPHY BY SOURCE SCANNING

Victor I. Neeley, Kennewick, and Hugo L. Libby, Richland, both of Wash., assignors to Holotron Corporation, Wilmington, Del.

Filed Aug. 23, 1967, Ser. No. 662,736
Int. Cl. G02b 27/22
U.S. Cl. 350—3.5 **17 Claims**



A technique of making holograms of three-dimensional objects with electromagnetic or ultrasonic radiation; a point source of radiation for the object beam is scanned over a plane and is received at a point. Holographic information is then obtained by mixing the received object beam with a coherent reference beam, either derived from the object beam source or introduced electronically. Reciprocity between the disclosed source-scanning technique and the conventional receiver-scanning technique is shown and specific embodiments are disclosed which utilize the source-scanning technique and which are illustrative of benefits which may be obtained through the utilization of such technique over the receiver-scanning technique.

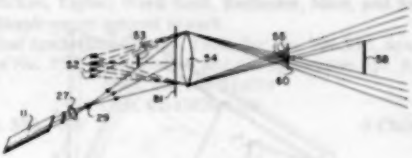
3,640,599

SIMULATION OF AN EXTENDED INCOHERENT OBJECT SOURCE IN HOLOGRAPHY SO AS TO ELIMINATE SPECKLE NOISE

Raoul F. van Ligten, Framingham Centre, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 4, 1969, Ser. No. 813,510
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 **9 Claims**

This specification discloses systems for recording holograms and for reconstructing images from such holograms. The object of which the hologram is to be made is illuminated with a plurality of coherent point sources of light. Light from the object forms an interference pattern with light from a reference point source of coherent light. This interference pattern is recorded to provide the hologram. In the reconstruction, a lens is provided to produce images of the reconstructions of the coherent light sources and of the reconstruction of the object. A mask is provided in the plane



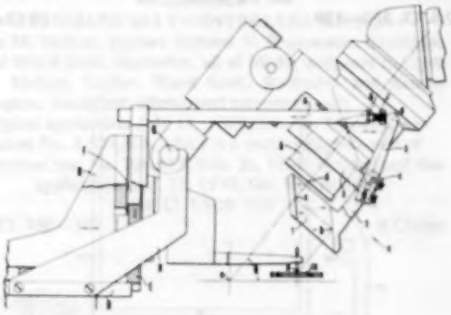
of the images of the reconstructed coherent sources, which mask is provided with means to transmit bundles of rays corresponding to different ones of the coherent light sources in sequence. As a result, a composite image will be produced approaching the appearance of the object illuminated by an extended incoherent source.

3,640,600

ROCKING-TYPE APPARATUS PROVIDED WITH PRISM OR MIRRORS IN MICROSCOPE FOR BONDER

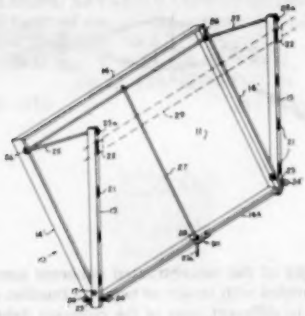
Masahide Isobe, Hayamacho, Japan, assignor to Tokyo Sokuhan Co., Ltd., Zama-machi, Koza-gun, Kanagawa-ken, Japan

Filed Oct. 15, 1969, Ser. No. 866,526
Claims priority, application Japan, Oct. 29, 1968, 43/78818
Int. Cl. G02b 7/18
U.S. Cl. 350—34 **6 Claims**



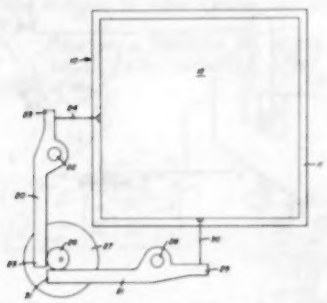
A rocking-type microscope apparatus for a dice bonder comprises a prism or a pair of mirrors pivoted about a rocking axis at the lower part of the front end of the microscope on the face toward the objective. The rocking axis is mounted on one side of a cylindrical casing accommodating the objective of the microscope, or is mounted on one end of a bracket secured to a guide member of a sliding head or other element at an optional position. The prism or pair of mirrors can be rocked into and out of operative relation with the objective by means of a push rod, secured to the sliding head, in connection with a lever pivotal on the rocking axis and fixed relative to the prism or mirrors.

3,640,601
PROJECTION SCREENS
Louis Daniel Murray, 5216 Ponderosa Way, Dallas, Tex.
Filed Dec. 18, 1969, Ser. No. 886,056
Int. Cl. G03b 21/56
U.S. Cl. 350—117 10 Claims



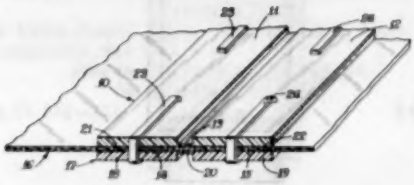
In the present device the screen is rotatably mounted along the lower ends of its sides by brads to vertical support arms, while the upper portion of the screen is fastened to a cord which is retained in an adjustable keeper so adjustment of the tilted position of the screen is provided by loosening or tightening of the cord. Vertical adjustment of the screen is provided by spaced pairs of slots in the vertical support arms, these slots accommodating the supporting wall hooks.

3,640,602
PROJECTION SCREEN
Robert N. Wolfe, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 7, 1969, Ser. No. 814,006
Int. Cl. G03b 21/56
U.S. Cl. 350—120 10 Claims



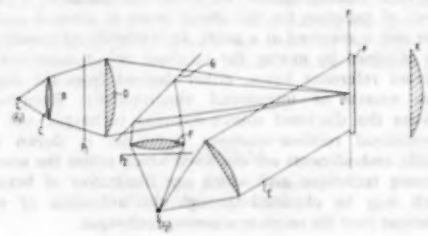
A projection screen for eliminating scintillations caused by a projected image in which the screen comprises two spaced and generally parallel glass plates that are maintained as a unit by a layer of transparent material therebetween. The plates are provided on their facing surfaces with a layer of light-diffusing material and the surfaces are joined by a transparent, resilient material which will permit orbital movement of one plate relative to the other.

3,640,603
PLASTIC REINFORCING EDGING FOR PICTURE-RECEIVING SCREEN
Michael J. Balmes, Spokane, Wash., assignor to Graflex, Inc., Rochester, N.Y.
Filed Nov. 5, 1969, Ser. No. 874,267
Int. Cl. G03b 21/56
U.S. Cl. 350—124 5 Claims



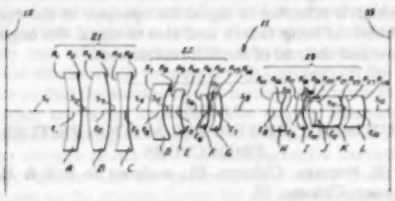
A reinforcing strip for application to the edges of a projected picture receiving fabric screen is provided with a pair of laterally spaced side portions. Complementary reinforcing edgings are applied to the top and underside portions of the upper and lower edging strips stapled together. The fabric and the central portions of the upper and lower reinforcing edgings are then cut so that the reinforcing strips form marginal reinforcing edgings for the lower part of one screen fabric and the upper part of a succeeding screen fabric. The inner flat surfaces of the side edges of the reinforcing strips are saw-toothed or otherwise roughened to cause a firm gripping of the intermediately disposed fabric.

3,640,604
OPTICAL INFORMATION PROCESSING METHOD EMPLOYING PHOTOCHEMICALLY GENERATED HOLOGRAMS AS SPATIAL FILTERS
John Yarnell, St. Albans, England, assignor to Hawker Siddeley Dynamics Limited, Hatfield, England
Continuation of application Ser. No. 649,594, June 28, 1967, now abandoned. This application May 1, 1970, Ser. No. 31,856
Claims priority, application Great Britain, 29,298/66
Int. Cl. G02b 27/22, 5/18
U.S. Cl. 350—162 SF 2 Claims



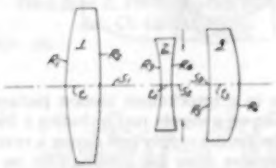
This invention provides a novel method of optical information processing, using a photochromically generated hologram as a spatial filter. A diffraction pattern is produced on a photochromic plate which is simultaneously illuminated by a reference beam from a coherent source. A second diffraction pattern employing light from a coherent source is superimposed on the first diffraction pattern on the photochromic plate, so that the reference beam illumination and the second diffraction pattern form a photochromically generated hologram to modify the first diffraction pattern. A photochromic plate may comprise material that exhibits normally unpopulated triplet states of molecular energy, population of which can be induced by photons of appropriate energy.

3,640,605
MECHANICALLY COMPENSATED ZOOM LENS SYSTEM
Harold N. Sissel, 133 S. Cedar Street, Glendale, Calif.
Filed Nov. 12, 1970, Ser. No. 88,787
Int. Cl. G02b 15/16
U.S. Cl. 350—184 2 Claims



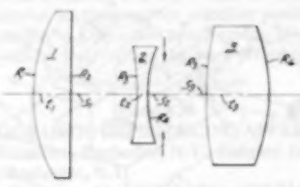
A mechanically compensated zoom lens system made up of three lens groups, the front lens group being fixed and the middle and rear lens groups being movable.

3,640,606
THREE-ELEMENT MICROPHOTOGRAPHIC OBJECTIVE LENS
Lawrence H. Conrad, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 20, 1970, Ser. No. 91,436
Int. Cl. G02b 9/16
U.S. Cl. 350—226 1 Claim



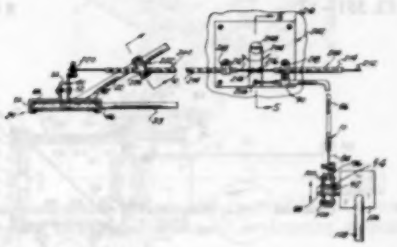
A three-element *f*/4.5, 19× magnification objective lens comprising three airspaced elements from front to rear including a biconvex lens element, a biconcave lens element and a concavo-convex lens element.

3,640,607
THREE-ELEMENT MICROPHOTOGRAPHIC OBJECTIVE LENS
Lawrence H. Conrad, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Nov. 20, 1970, Ser. No. 91,437
Int. Cl. G02b 9/16
U.S. Cl. 350—226 1 Claim



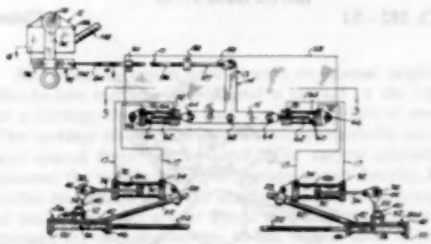
A three-element *f*/4.5, 19.5× magnification objective lens comprising three airspaced elements from front to rear including a planoconvex lens element, a biconcave lens element and a biconvex lens element.

3,640,608
AUTOMATICALLY CONTROLLED MIRROR
Clyde M. McKee, Taylor; Andrew V. Provenzino, Southgate, and Ward Scott, Rochester, all of Mich., assignors to Clyde M. McKee, Taylor; Ward Scott, Rochester, Mich. and Sandor Shapiro, part interest to each
Original application Feb. 20, 1968, Ser. No. 706,953, now Patent No. 3,536,382. Divided and this application Apr. 8, 1970, Ser. No. 31,039
Int. Cl. G02b 5/08
U.S. Cl. 350—307 5 Claims



A mirror assembly for trucks or the like actuated in response to movement of the steering wheel to move to a position providing maximum visibility. A cable assembly is clamped to a member which is pivotally movable upon rotation of the steering wheel in such a way that pivoting of the member produces axial movement of a cable. In one embodiment the cable is connected through a pivotal member to a second set of cables which actuate the mirrors and in another embodiment a hydraulic system is connected with the cable to actuate the mirrors.

3,640,609
AUTOMATICALLY CONTROLLED MIRROR
Clyde M. McKee, Taylor; Andrew V. Provenzino, Southgate, and Ward Scott, Rochester, all of Mich., assignors to Clyde M. McKee, Taylor; Ward Scott, Rochester and Sandor Shapiro, Southfield, Mich., part interest to each
Original application July 17, 1968, Ser. No. 745,434, now Patent No. 3,527,528, which is a continuation-in-part of application Ser. No. 706,953, Feb. 26, 1968. Divided and this application Apr. 22, 1970, Ser. No. 30,637
Int. Cl. G02b 5/08
U.S. Cl. 350—307 4 Claims



A mirror assembly for trucks or the like actuated in response to movement of a steering wheel to move to a position providing maximum visibility. Means are clamped to a

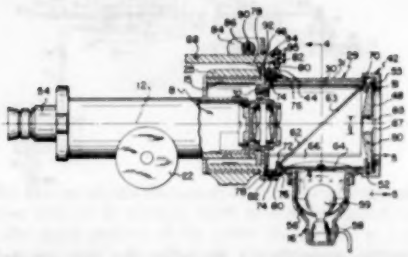
member which is a part of the steering mechanism and which is pivotally movable upon rotation of the steering wheel in such a way that pivoting of the member is translated through the means to a T-shaped pivotal member. The T-shaped pivotal member is connected to a hydraulic system to produce rotation of the mirrors upon pivotal movement of the T-shaped member.

3,640,610

OPHTHALMOMETER DEVICE HAVING TARGET MEANS INDEPENDENTLY ADJUSTABLE WHILE MAINTAINING THE CORNEAL IMAGE IN FOCUS

Joseph S. Nupuf, 1342 Cleveland Avenue, N.W., Canton, Ohio

Filed Sept. 28, 1970, Ser. No. 76,171
Int. Cl. A61b *3/10; G01b 9/00*
U.S. Cl. 351—13 **8 Claims**



A device for determining the topography of an optic including a support member having a measuring unit mounted thereon. The measuring unit includes an optical system having a target assembly operably associated therewith and mounted in optical alignment with the optical axis of the optical system. Means included to maintain the optic in stationary, aligned relation with the optical axis. The target assembly includes a target member adapted to be illuminated by a source of light to produce an illuminated image on the reflective surface of the optic. The target member is mounted for selective telescopic movement along the optical axis of the optical system for increasing or decreasing the size of the image produced on the reflected surface of the optic to enable measurement of the curvature of relatively larger or smaller areas of the surface thereof.

3,640,611

CONTROL FOR MOTION PICTURE PROJECTORS

Angelo Boudouris, Sylvania; Stanley J. Kulish, Jr., Holland, and Harold M. Plumadore, Toledo, all of Ohio, assignors to Eprad Incorporated, Toledo, Ohio

Filed Nov. 21, 1969, Ser. No. 878,611
Int. Cl. G03b *21/50*
U.S. Cl. 352—92 **8 Claims**

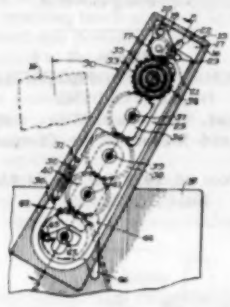
Controls for motion picture projectors are designed to automatically change over the operation from one projector to the other to provide continuous showing of sequential reels of film. The controls embody a pickoff device in each projector having two contact shoes, one of which is effective to initiate changeover and the other of which is effective to operate auxiliary controls or circuits. The controls further prevent changeover from one projector to the other in the event of a film break which would cause circuits to be completed through both shoes. An alarm system is also provided which is effective to signal the operator in the event of a film break or lamp failure and also to signal the beginning of a show and the end of the last reel thereof.

3,640,612

AUTOMATIC REWIND FOR MOTION PICTURE PROJECTORS

Arthur E. Nupnau, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 6, 1969, Ser. No. 863,867
Int. Cl. G03b *23/00, 1/00*
U.S. Cl. 352—124 **8 Claims**



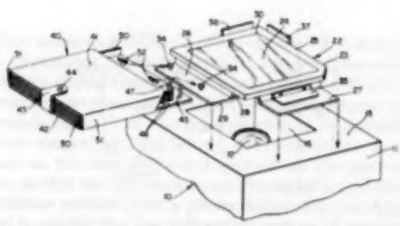
A mechanism in a sprocketless motion picture projector for rewinding film on a supply reel including a friction drive for taking up film on the supply reel during a reverse projection mode, a positive drive for winding film on the supply reel during a rewind mode and a control means operable by a film tension sensing means to automatically cause the positive drive to bypass the friction drive when changing from a projection mode to the rewind mode.

3,640,613

TRANSPARENCY DISPLAY APPARATUS

Paul E. Kitch, West Springfield, Mass., assignor to Scott Paper Company, Delaware County, Pa.

Original application Mar. 24, 1967, Ser. No. 625,841, now Patent No. 3,536,393. Divided and this application Jan. 9, 1970, Ser. No. 10,117
Int. Cl. G03b *21/00*
U.S. Cl. 353—23 **4 Claims**



Transparency display apparatus is disclosed including a transparency storage device for protecting transparencies during transport and for facilitating display of transparencies

upon an overhead projector and a staging assembly mountable on the stage of an overhead projector and cooperating with the storage device for transparency display. The storage device is separable from the staging assembly during transport of the transparencies and is constructed in a manner which fully protects the transparencies by providing covers and sides which form a package for holding the transparencies. When utilized for displaying transparencies, the storage device may be opened up and the covers pivoted out of place into a position where they support transparencies before and after display. The staging assembly includes fastener means which cooperate with fasteners on the storage device so that the storage device is supported while the transparencies are being displayed. The staging assembly has a transparent panel positioned above a light source and relative to the storage device so that transparencies carried in the storage device can be pivoted about their point of attachment to the storage device for selective display over the transparent panel on the overhead projector. The staging assembly also includes supports adjacent the transparent panel for supporting the covers of the storage device in a position where transparencies can be collected and disposed upon one of them before and after display. Individual transparencies retained in the apparatus may be moved about an axis lying in the plane of the transparency as well as about an axis intersecting the plane of the transparency, generally one perpendicular thereto.

3,640,614

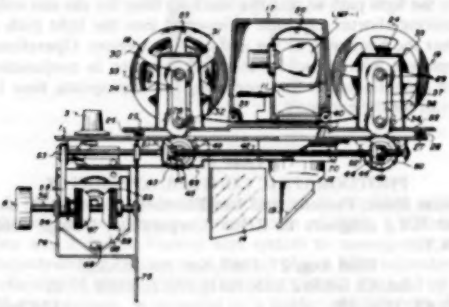
FILM SUPPORT AND TRANSPORT APPARATUS

James R. Cassano, Penfield; Charles E. Smith, Webster, and Robert E. Kalvitis, Fairport, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 2, 1969, Ser. No. 829,401

Int. Cl. G03b *23/12*

U.S. Cl. 353—26 **4 Claims**



Apparatus for supporting an elongated web of film transparency material in a reel-to-reel arrangement at a projection station in a film viewing device. Film material is selectively transported from one reel to the other past the projection station by both a manual and a powered drive arrangement. The film material is supported for selective positioning at the projection station in a direction transverse to the direction of film travel without interrupting the drive arrangement.

3,640,615

XEROGRAPHIC REPRODUCING APPARATUS

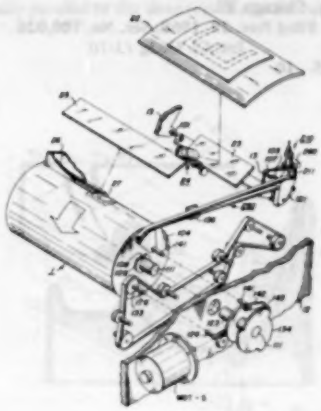
Robert A. Schaeffer, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Nov. 14, 1967, Ser. No. 682,830

Int. Cl. G03g *15/04*

U.S. Cl. 355—8 **12 Claims**

An automatic xerographic reproducing apparatus for reproducing and standardizing computer printout including an optical scanning system adapted to selectively vary the length and speed of scan in response to the size of the



original document to create a standardized output format by reproducing an original document or creating a facsimile thereof.

3,640,616

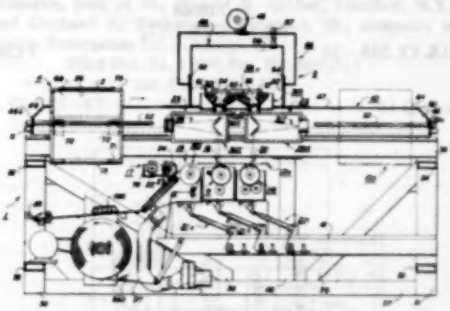
OPAQUE ILLUMINATION AND SCANNING SYSTEM

Raymond K. Egnaczak, Williamson, and Gino F. Squassoni, Pittsford, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Nov. 14, 1969, Ser. No. 876,713

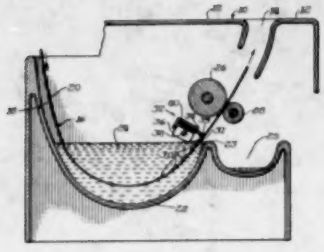
Int. Cl. G03g *15/00*

U.S. Cl. 355—8 **14 Claims**



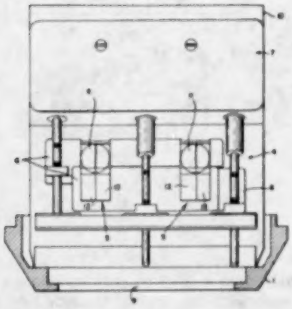
An optical system is used to scan an opaque original in a line-by-line manner. The original is carried on the top deck of a carriage that travels past a stationary optical assembly. The carriage also has a bottom deck substantially parallel to and spaced from the top deck. The optical assembly fits between the two decks as the carriage travels thereby. Lamps within the optical assembly illuminate a generally linear area of the original and a light image of the original is projected through the optical assembly to the bottom deck of the carriage by a lens and three mirrors. One mirror is positioned at the nodal point of the lens to pass rays through the same lens twice. The light image projected to the bottom deck is used to expose a photoelectrophoretic ink for the formation of an image from the ink.

3,640,617
TONER DOCTOR MEANS
Donald M. Fredrickson, Deerfield, and Johannes H. Bungener, Glenview, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.
Filed Nov. 29, 1968, Ser. No. 780,026
Int. Cl. G03g 15/10
U.S. Cl. 355—10 8 Claims



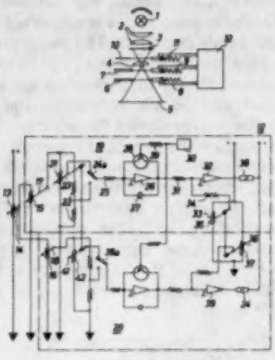
Doctoring apparatus for use in the developing station of an electrostatic copying machine for removing excess liquid toner from the developed image surface of the sheet prior to squeegeeing of the sheet. Removal of excess toner eliminates image trailing, haloing and offsetting.

3,640,618
METHOD AND APPARATUS FOR PHOTOGRAPHIC COLOR PRINTING
Keith Aston, Cheam, Surrey, England, assignor to The Pavelle Corporation, New York, N.Y.
Filed Mar. 10, 1969, Ser. No. 805,529
Claims priority, application Great Britain, Mar. 11, 1968, 11,748/68
Int. Cl. G03l 27/32
U.S. Cl. 355—35 7 Claims



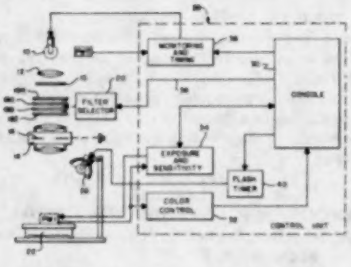
Apparatus for printing a photographic color print from a color transparency or negative includes a compound color filter consisting of two additive color filters to provide a device having the speed of operation of a conventional subtractive printer apparatus when printing color negatives of good color balance. The apparatus automatically introduces the accuracy of an additive printer system when unbalanced color negatives are being printed.

3,640,619
CONTROL ARRANGEMENT FOR COPYING APPARATUS
Hans-Peter Huber, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Jan. 27, 1970, Ser. No. 6,198
Claims priority, application Germany, Jan. 29, 1969, P 19 04 253.6
Int. Cl. G03b 27/76
U.S. Cl. 355—36 9 Claims



An arrangement for controlling and shortening the exposure times of copying apparatus adapted to two colors on an original or master to be copied. The light source in the copier transmits light of the two colors along a path into which blocking filters may be selectively inserted. One blocking filter is provided for each one of the colors. Two adjustable timing generators control the insertion of the blocking filters into the light path so that the blocking filter for the one color requiring shorter exposure is inserted into the light path at either the beginning or the end of the exposure. Operational amplifiers with capacitor feedback operate in conjunction with potentiometers for generating the appropriate time intervals for the exposure.

3,640,620
PHOTOGRAPHIC CONTROL APPARATUS
Abram Shatz, Pomona, and Ben Eisenberg, Larchmont, both of N.Y., assignors to Kriser Corporation, College Point, N.Y.
Filed Aug. 27, 1969, Ser. No. 853,285
Int. Cl. G03b 27/76; H01j 39/12; H05b 37/02
U.S. Cl. 355—38 12 Claims



Photographic apparatus is disclosed capable of controlling all known photographic processes for exposing photosensitive material, including processes for producing color separa-

tion films and plates of the type used in various photomechanical reproduction processes. Photometric measurements are made in the plane of the material which is to be exposed and these measurements are used to program a control unit to establish required exposure time intervals. A set of color-balancing controls for each of the primary colors is provided to establish the relative exposures required for the respective color films or plates. A special timing circuit ensures that the exact amount of light required for proper exposure will be provided regardless of any fluctuation in luminous flux as measured at the enlarger or at the camera copy board. Additionally, the timing circuit permits selection of desired exposure intervals (separate from the main exposure interval) as required for various known photographic operations.

3,640,621

VIEWER-PROJECTOR-COPIER APPARATUS FOR MICROFORMS

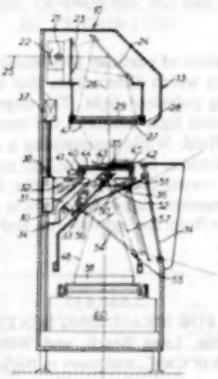
Raymond Frerson, St. Germain-les-Arpajon; Claude Gravier, Verrieres-le-Buisson; Pierre Ravenel, Clamart, and Pierre Soupene, Chatillon-s/-Bagneux, all of France, assignors to Electricite de France (Service National), Paris, France

Filed Mar. 23, 1970, Ser. No. 21,716

Claims priority, application France, Mar. 24, 1969, 6908520

Int. Cl. G03b *27/70*

U.S. Cl. 355—45 **10 Claims**



A microform viewer-projector-copier is provided with a light source providing a conical beam of light, a diffusion plate and a double Fresnel lens system to homogenize and concentrate the beam on a nodal plane. The microform, preferably of the type which includes at least one and up to 128 microimages, is mounted in a holder which is movable along the axis of the light beam and provided with means for positioning the microimages to be illuminated by the light beam. A plurality of lens systems are mounted on a turret for positioning in the nodal plane any one of them to focus the image of the illuminated portion of the microform onto either a viewing screen or the copier plane of a copier. A servomechanism is provided for each of the movements of the microform holder as well as the positioning of any one of the lens systems in the nodal plane.

3,640,622

EXPOSURE-CONTROL DEVICE IN COPYING MACHINES

Akira Shinozaki, Tokyo, Japan, assignor to Konishiroku Photo-Industry Co., Ltd.

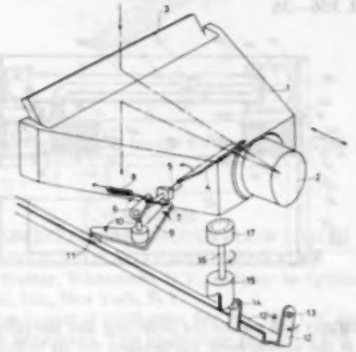
Filed May 7, 1970, Ser. No. 35,477

Claims priority, application Japan, May 10, 1969, 44/42,382

Int. Cl. G03b *27/76*

U.S. Cl. 355—65 **6 Claims**

An improved exposure control device for a copying apparatus of the type having a movable optical system in said apparatus for scanning an original to be reproduced, the improved exposure control device having a pivotal shield movable with said optical system for varying the degree of exposure; a bar mounted in said copying apparatus and positioned substantially parallel to the direction of the movement of said optical system, said bar being mounted on said means for operating the exposure control device; and means movably mounted on said bar and mounted on said shield for transmitting motion of said bar to said shield whereby movement of said operating means will change the position of said shield.



3,640,623

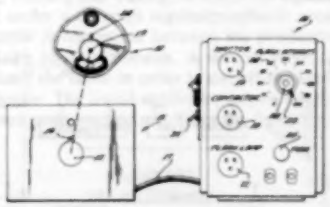
AUTOMATIC DENSITY SETTING APPARATUS

Leonard S. Florsheim, Jr., Lake Forest; David A. Lieberman, Wilmette, both of Ill.; Harold B. Archer, Pittsford, N.Y., and Gerhard A. Nothmann, Winnetka, Ill., assignors to Enivar Enterprises Inc., Chicago, Ill.

Filed Oct. 24, 1969, Ser. No. 869,013

Int. Cl. G03b *27/54*

U.S. Cl. 355—67 **21 Claims**



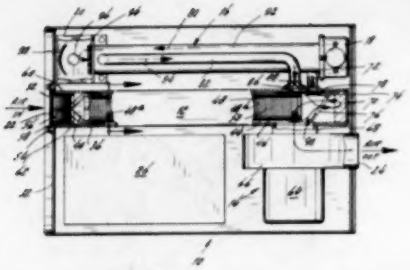
A device that converts copy densities into exposure times for main, flash and bump exposures required in halftone reproduction. Two separately movable scales of an evaluator are set to store intelligence mechanically corresponding to highlight and shadow densities of material to be copied. The evaluator is then placed into a receptor which is connected electrically to a master control unit to convert the evaluator mechanical settings into appropriate electrical signals for automatically regulating the camera lights, the auxiliary flash lamp and the shutter of the camera in order to automatically and instantaneously provide properly exposed main, flash and bump exposures.

3,640,624

AIR POLLUTION DETERMINATION BY MERCURY AIR SAMPLING

Howard H. Anderson, Covina; Rudolph H. Moyer, West Covina; Donald J. Sibbett, Cucamonga, and David C. Sutherland, El Monte, all of Calif., assignors to Geomet, Incorporated, Rockville, Md.

Filed Apr. 29, 1970, Ser. No. 32,917
Int. Cl. G01n 1/00, 33/28, 21/12
U.S. Cl. 356—36 8 Claims



Apparatus and system for detecting and sampling mercury vapor in the atmosphere, particularly for air pollution determination, utilizing sensitized absorption of the vapor on surfaces of noble metal wire grids. The wire grids operate to concrete encountered low levels of vapors. Release of mercury from the grids into a photometer for quantitation is achieved by direct passage of electrical current through the grid wire. The grids are designed to allow for ohmic heating of the absorbent wire to render possible a portable monitoring device.

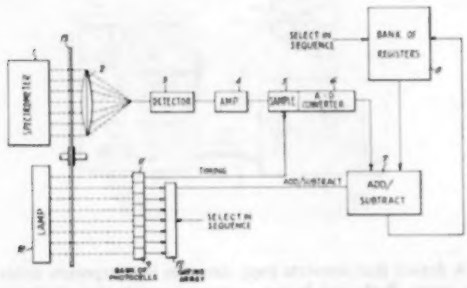
The apparatus and system incorporates means for volitilizing or decomposing mercury-bearing particulates for direct absorption of the vapor on the grids or in conjunction with a heated prefilter.

3,640,625

MULTIPLEX SPECTROMETER

Roland Norman Ibbett, Cheadle, and David Aspinall, St. Anne's-on-Sea, both of England, assignors to National Research Development Corporation, London, England

Filed June 7, 1968, Ser. No. 735,336
Claims priority, application Great Britain, June 8, 1967, 26,601/67
Int. Cl. G01j 3/00, 3/02
U.S. Cl. 356—97 5 Claims



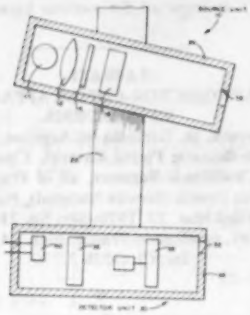
A multiplex spectrometer has its spectral line information ncoded by transmitting the line through rows of apertures resented in sequence. The apertures occur in a pattern erived from a matrix of binary numbers. Decoding is chieved by adding or subtracting the output in a store conuining addresses equal to the number of columns in the iatrix.

3,640,626

MEASURING OF THE CONCENTRATION OF SOLID PARTICLES SUSPENDED IN VARIOUS REGIONS IN A FLUID USING POLARIZED LIGHT

John W. Liskowitz, Belle Meade, N.J., assignor to American Standard, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 629,568, Apr. 10, 1967, now abandoned. This application Nov. 12, 1968, Ser. No. 774,892
Int. Cl. G01n 21/00, 21/40
U.S. Cl. 356—103 8 Claims



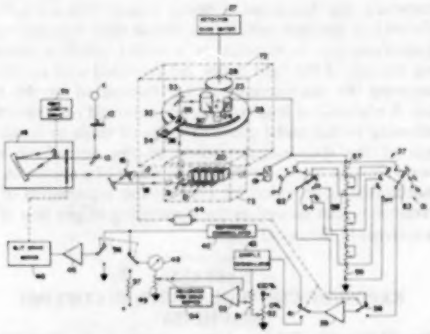
The concentration of particles suspended in a fluid, having a refractive index which differs from that of the fluid, is accomplished using polarized light. The degree of depolarization of the incident light indicates the concentration of the particles in the fluid. While maintaining a constant observation angle, the distance between the light source unit and the detector unit is varied thus changing the focal point of the system. In this manner, suspended particle concentrations at varying distances from the light source and detector unit are obtained.

3,640,627

APPARATUS FOR MEASURING SCATTERED LIGHT

Willard H. Beattie, Long Beach, and William S. Gallaway, Fullerton, both of Calif., assignors to Beckman Instruments, Inc.

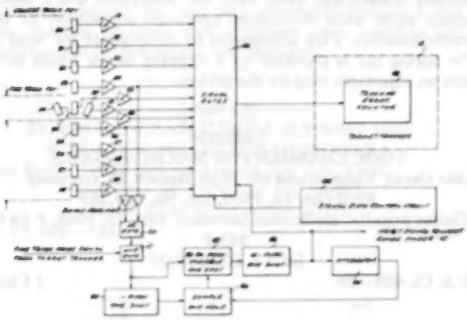
Filed Mar. 1, 1965, Ser. No. 435,792
Int. Cl. G01n 21/00, 1/10
U.S. Cl. 356—104 9 Claims



A light-scattering accessory for double-beam spectrophotometers and an improved double-beam, ratio-recording light-scattering spectrophotometer are disclosed. The at-

tachment may be utilized to convert a standard double-beam spectrophotometer into a scattered light-measuring device and consists of an attachment having housed therein a means for directing the sample beam to a sample cell and a detector located on a goniometer rotatable about the cell. The reference beam is passed through an optical attenuator to the detector of the spectrophotometer. Electrical attenuation devices are provided and may comprise either a single attenuating potentiometer connected to each of the detectors or separate attenuators connected to the separate detectors. The attenuators allow measurement of signals over a wide dynamic range by attenuating either the reference or the sample signal and when utilized in combination with the optical attenuator located in the reference beam provide an extremely wide dynamic range for the instrument. Also disclosed is a novel sample cell and beam trap, the beam trap consisting of a piece of black glass having at least one optically flat surface and a black glass rod attached thereto to suspend the glass plate in the beam. The sample cell may be provided with a single optically transmitting window and the beam trap located within the cell for improved results.

3,640,628
ELECTRO-OPTICAL TARGET ACQUISITION BLANKING SYSTEM
Sheldon Jones, Palos Verdes Estates, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Dec. 18, 1969, Ser. No. 886,333
Int. Cl. G01b *11/26*
U.S. Cl. 356—152 **11 Claims**



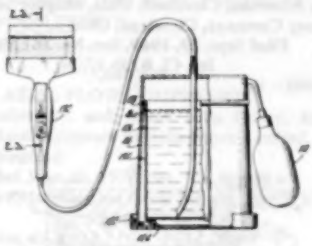
When an electro-optical tracking and ranging system is placed in proximity with the guns being controlled thereby, such as on the turret of a tank, there are a range of azimuth and elevation angles of the gun within which the flame present when the guns are being fired serves to temporarily disrupt the tracking process. Means are provided for sensing and/or anticipating the firing of the gun within the critical fields of azimuth and elevation angles and blanking the electro-optical detector over the interval of the occurrence of the gun flame. This prevents saturation of the detector by the gun flame and the disruption of the circuitry included therein which occurs otherwise.

3,640,629
SHEET MATERIAL
Edward M. Geiser, Downers Grove, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Feb. 5, 1970, Ser. No. 8,784
Int. Cl. B32b *1/00*
U.S. Cl. 401—132 **11 Claims**

A perfumed dispenser which comprises a tape or strip of narrow sheet material having a raised portion at each edge and pressure-rupturable microcapsules containing aroma

chemical entrapped in the trough formed between the raised edges.

3,640,630
PRESSURIZED CONTINUOUS FLOW LIQUID APPLICATOR WITH SHUTOFF VALVE
Harold L. Walker, Whitestone, N.Y., assignor to Applications Unlimited, Inc., New York, N.Y.
Continuation-in-part of application Ser. No. 794,175, Jan. 27, 1969, now abandoned. This application June 26, 1970, Ser. No. 50,263
Int. Cl. A46b *11/02*
U.S. Cl. 401—188 **8 Claims**

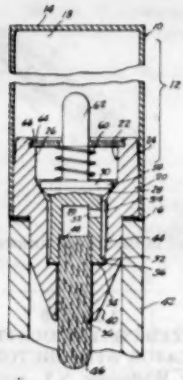


A system for the application of liquid to a surface, such as by painting, washing and waxing, in which the liquid source is maintained under a constant superatmospheric pressure and a flexible cable is connected between the pressurized liquid source and the liquid applicator. A shutoff valve can selectively pinch-off the cable in order to cut off the liquid supply to the applicator. The liquid applicator can be fixed or movable to selected positions and may be in the form of a roller.

3,640,631
MARKING PEN
Piro Sotir, 47 Montana Drive, Holden, Mass.
Filed Sept. 26, 1969, Ser. No. 861,294
Int. Cl. B43k *5/08*
U.S. Cl. 401—206 **4 Claims**

A marking applicator comprising a container having a fluid reservoir therein and a marking nib extending out of the other end of the container for applying fluid or ink to a surface, said nib being disposed in a cylindrical holder having a central bore therein with at least two shoulders therein with one forming a valve seat, a valve plunger secured to said nib and disposed within said bore, said valve plunger having two sealing surfaces thereon with one adapted to seat against one of said shoulders and spring biasing means normally maintaining said valve plunger in a closed position seated upon said shoulder. A secondary reservoir disposed within said

valve plunger and in communication with said nib and with an annular channel provided between said valve plunger and



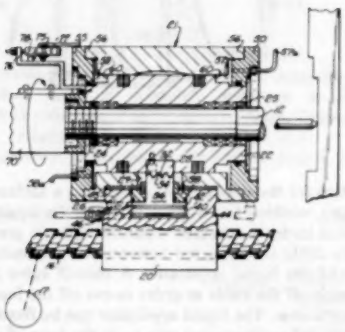
said central bore and a bypass passage disposed in said holder adjacent said central bore for supplying fluid to the exterior of said nib when said valve plunger is unseated.

3,640,632

MACHINE TOOL SPINDLE AND CONTROL THEREFOR

Ralph H. Schuman, Cleveland, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Sept. 29, 1969, Ser. No. 861,590
Int. Cl. B23b *47/24*
U.S. Cl. 408—11 17 Claims



A machine tool having a rotatable machine tool spindle for performing drilling and tapping operations. The spindle has limited axial movement relative to the spindle carrier. Fluid pressure means may be operated to displace the spindle in opposite directions from a predetermined position in the spindle carrier and to apply a force yieldably opposing return of the spindle to the predetermined position. The position of the spindle in its carrier is sensed by control means and the spindle carrier is translatable toward or away from the workpiece in response to the direction of displacement of the spindle from its predetermined position. The spindle is displaced forwardly to effect translation of the spindle carrier and spindle to engage a tool with a workpiece and the return of the spindle to the predetermined position upon the engagement of the tool with the workpiece is utilized to initiate control means for automatically controlling the depth of drilling or tapping as measured from the surface of the workpiece and the return of the spindle to an automatic repeat position or to a home position. The spindle is allowed to float while a tapping tool is in engagement with the workpiece and the feed and return of the spindle carrier is controlled during this period by sensing the position of the spindle in the carrier. During drilling the spindle is locked against axial movement relative to the carrier while the tool is in engagement with the workpiece. The locking means is engageable over the range of axial movement of the spindle relative to the carrier to locate the spindle in a predetermined position relative to the carrier.

3,640,633

ADJUSTABLE BORING QUILL ASSEMBLY

Richard C. Gersch, 27401 Red Leaf Lane, Southfield, Mich., and Roland Bruce Reynolds, 1628 Haynes, Birmingham, Mich.

Filed Aug. 28, 1969, Ser. No. 853,696
Int. Cl. B23b *47/22*
U.S. Cl. 408—12 10 Claims

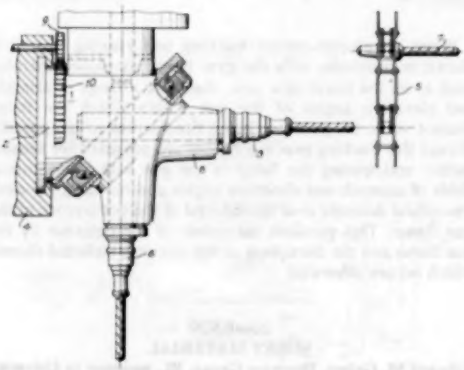
An automatically adjustable boring and turning quill assembly for a boring machine and including an adjustable eccentric sleeve member for moving or turning the boring bar radially toward and away from the workpiece and a piston which upon axial movement produces adjustment of the sleeve member. Fine adjustment to compensate for wear of the boring bar is provided by a stepping motor which actuates an adjustable stop for the piston.

3,640,634

TOOL CHANGER FOR MACHINE TOOLS

Otto Oeckl, Tizianstrasse 60, 8000 Munich 19, Germany

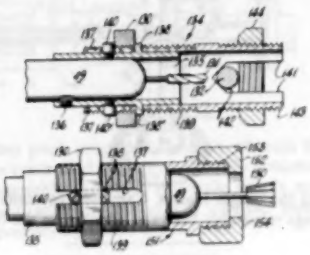
Filed Oct. 14, 1969, Ser. No. 866,269
Claims priority, application Germany, Oct. 25, 1968, P 18 05 343.5
Int. Cl. B23b *39/20*
U.S. Cl. 408—35 1 Claim



The headstock of a machine tool carries two spindles alternately turnable from a tool-working to a tool-changing position. In addition, the headstock is turnably mounted on the machine tool body so that the spindle in tool-changing

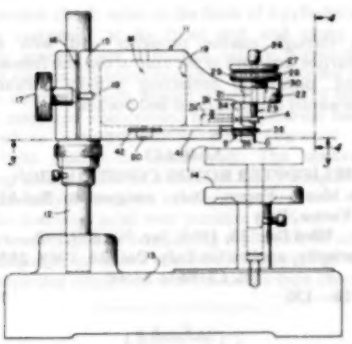
position is always aligned with a tool magazine even when the spindle in working position is inclined to the vertical.

3,640,635
HAND DRILL AND DRILL PRESS
John Von Hollen, P.O. Box 185, Cedar Grove, N.J.
Filed Feb. 24, 1970, Ser. No. 13,472
Int. Cl. B23b *45/14*
U.S. Cl. 408—101 **8 Claims**



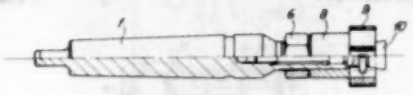
The invention contemplates a miniature drill which is hand-held at a quill or sleeve on the drill axis, in the manner of a pencil or pen. The tool includes mass eccentric to the drill axis for absorbing reaction torque occasioned by drill operation. In one employment, the fingers of the hand which holds the sleeve also steady the drill against the workpiece, and in another employment a work-supporting jig fastened to the sleeve converts the tool into a portable miniature drill press, assuring accurate tool alignment upon entering and through a drill-feeding stroke into the work.

3,640,636
INTERCHANGEABLE DRILL SUPPORT AND ACTUATING MEANS FOR MICRODRILL
Heinz Reich, 15076 Dickens Avenue, San Jose, Calif.
Filed May 25, 1970, Ser. No. 39,981
Int. Cl. B23b *41/14, 47/16, 47/18*
U.S. Cl. 408—128 **10 Claims**



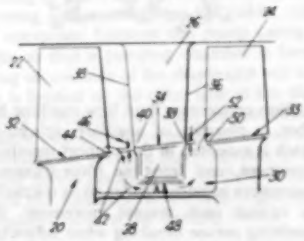
For a Pick-feed-type drilling apparatus having a belt and pulley drive for maintaining a drill shaft in raised condition and on open bearings for axial movement, an interchangeable drill support for spaced hardened bearings and a spring-loaded actuating means between the drill shaft and a micrometer stroke-controlled plunger for maintaining the latter in raised condition relative to the drill shaft.

3,640,637
ADJUSTABLE MACHINE REAMER
Adolf Merz, Olten, Switzerland, assignor to Merz AG Dulliken, Dulliken, Switzerland
Filed Dec. 24, 1969, Ser. No. 887,830
Claims priority, application Austria, Dec. 27, 1968, A 12 589/68
Int. Cl. B23d *77/04*
U.S. Cl. 408—197 **5 Claims**



An adjustable machine reamer in which a screw connection is provided between the expansion member and the reamer shank, a threaded projection or attachment arranged on an extension at the rear end of the expansion member and a tapped bore formed in the reamer shank and having an internal screw thread adapted to the external screw thread on the threaded projection on the expansion member. The extension at the rear end of the expansion member and the reamer shank each have one annular, face ground bearing face thereon for aligning the longitudinal axes of the expansion member and of the shank relatively to each other. There are also provided an axial centering means having a ground centering bore in the reamer shank and a centering cylinder fitting into the centering bore on the extension at the rear end of the expansion member.

3,640,638
AXIAL FLOW COMPRESSOR
Jack Britt, Ambergate, and Alfred John Honey, Allestree, both of England, assignors to Rolls-Royce Limited, Derby, Derbyshire, England
Filed June 26, 1970, Ser. No. 50,100
Claims priority, application Great Britain, July 2, 1969, 33,367/69
Int. Cl. F01d *11/08*; **F04d** *29/00*
U.S. Cl. 415—172 **5 Claims**

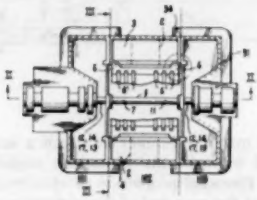


An axial flow compressor comprises a rotor having a plurality of axially spaced rings of rotor blades, a respective ring of stator blades being disposed immediately downstream of each ring of rotor blades, respective shroud surfaces being provided at the radially inner ends of the working surfaces of the stator blades by respective shroud rings carried by the rings of stator blades, running clearances being provided between the shroud rings and the rotor, and means whereby in operation a static pressure gradient is maintained in the clearance between at least one shroud ring and the rotor so that gas flow through the clearance is in a downstream direction.

3,640,639
UNIT CONSTRUCTION FOR TURBINE HOUSING BOTTOMS

Rudolf Ruhl, Nurnberg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nurnberg, Germany

Filed Oct. 10, 1969, Ser. No. 865,440
Claims priority, application Germany, Oct. 11, 1968, P 18 02 482.3
Int. Cl. F04d *29/40, 29/00, 1/06*
U.S. Cl. 415—219 7 Claims

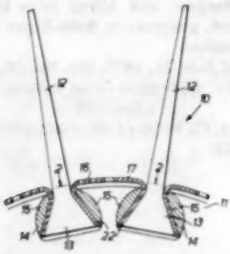


A low-pressure turbine housing has a bottom portion composed of two separate end units joined to at least one middle unit. The units are prefabricated small enough for ease of shipment and are field assembled.

3,640,640
FLUID FLOW MACHINE

Jack Palfreyman, Tansley, near Matlock, and Henry Edward Middleton, Derby, both of England, assignors to Rolls-Royce Limited, Derby, England

Filed Dec. 4, 1970, Ser. No. 95,993
Int. Cl. F01d *5/32*
U.S. Cl. 416—2 9 Claims



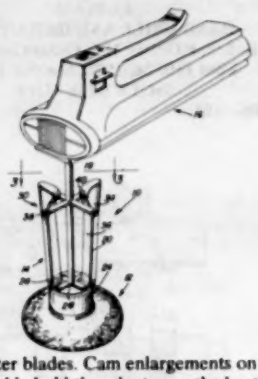
The invention concerns a fluid flow machine having a support member, a plurality of angularly spaced-apart blades each of which is mounted in the support member for limited pivotal movement, and frangible force-transmitting means which interconnect adjacent blades so as normally to restrain the blades against such pivotal movement, the frangible force-transmitting means breaking when subjected to a force exceeding a predetermined value.

3,640,641
ADAPTER FOR WORKING IMPLEMENTS

Guy D. Fitzhugh, P.O. Box 6053, Pine Bluff, Ark.

Continuation-in-part of application Ser. No. 660,797, Aug. 15, 1967, now Patent No. 3,472,490. This application Oct. 10, 1969, Ser. No. 865,427
Int. Cl. B01f *7/18*
U.S. Cl. 416—62 6 Claims

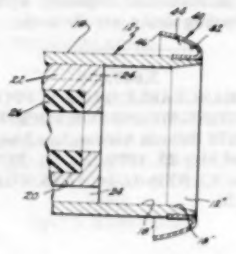
An adapter removably attaching working or cleaning implements to a portable, power-driven beater or to a tubular grip handle for alternative powered rotation and manual manipulation. The mounting body of the adapter is held in abutment with the end of the beater shank and is provided with torque transmitting prongs that extend between and axially beyond the beater blades. Cam enlargements on the ends of the prongs releasably hold the adapter on the beater.



3,640,642
MARINE FLOW THROUGH PROPELLER

Robert F. Kress, and Eldon L. Lorenz, both of Grand Rapids, Mich., assignors to Michigan Wheel Corporation, Grand Rapids, Mich.

Continuation-in-part of application Ser. No. 836,093, June 24, 1969, now Patent No. 3,554,665. This application Jan. 15, 1971, Ser. No. 106,689
Int. Cl. B63h *1/16, 11/14*
U.S. Cl. 416—93 7 Claims

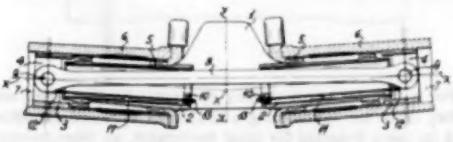


A flow through marine propeller unit with exhaust creepage barrier structure at the rear of the hub formed of an middle unit. protrusion projecting radially outwardly to define a forwardly oriented dead end pocket.

3,640,643
HELICOPTER ROTOR CONSTRUCTION

Giancarlo Monti, Varese, Italy, assignor to Siai-Marchetti S.p.A., Varese, Italy

Filed Dec. 23, 1969, Ser. No. 887,798
Claims priority, application Italy, Dec. 24, 1968, 25561/68
Int. Cl. B64c *27/48*
U.S. Cl. 416—136 7 Claims



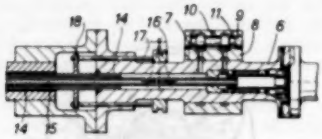
A paired blade helicopter rotor having a strut connecting the blades and a tie rod connecting each blade with the rotor hub, provision being made to pretension the tie rods.

3,640,644

CONTROLLABLE PITCH PROPELLER SYSTEM

Anders M. Liaaen, Alesund, Norway, assignor to A. M. Liaaen A/S, Alesund, Norway

Filed Mar. 27, 1970, Ser. No. 23,172
Claims priority, application Norway, Mar. 28, 1969, 1311/69
Int. Cl. B63h 3/08
U.S. Cl. 416—157 5 Claims



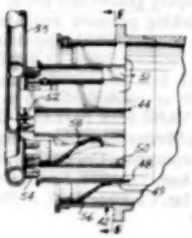
A controllable pitch propeller assembly wherein the pitch of the blades is controlled by an hydraulically actuated piston and cylinder assembly. Auxiliary hydraulic supply means are provided for actuating the piston and cylinder assembly in the event the primary hydraulic supply fails.

3,640,645

METHOD AND APPARATUS FOR ASPIRATING FLUIDS

Alan K. Forsythe, Seattle, Wash., assignor to Rocket Research Corporation, Redmond, Wash.

Filed Aug. 28, 1969, Ser. No. 853,647
Int. Cl. F04f 5/50, 5/18
U.S. Cl. 417—174 20 Claims



An aspirator check valve in the form of a cylindrical sleeve which is restrained at its front end and along circumferentially spaced lines extending axially rearwardly from said front end, and is unrestrained in the remainder of its extent. The sleeve lies tight against an outer wall of the aspirator when open and when closed by back pressure buckles inwardly where unrestrained, to place rearward portions thereof tight against an inner wall. The upstream end restraining means includes a resilient band designed to flex radially inwardly in response to an over pressure, so that such sleeve also functions as an over pressure relief valve.

A shortened aspirator comprising a plurality of concentrically arranged primary and secondary flow passageways, and such an aspirator combined with the sleeve-type check valve.

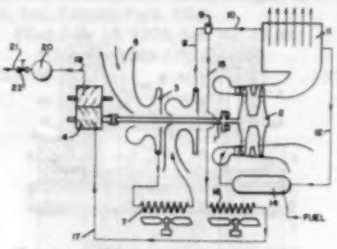
3,640,646

AIR COMPRESSOR SYSTEM

Hanns Hornschuch, Easton, Pa., and William T. Alderson, Brookside, N.J., assignors to Ingersoll-Rand Company, New York, N.Y.

Filed Mar. 26, 1970, Ser. No. 22,982
Int. Cl. F04b 23/14, 23/00, 17/00
U.S. Cl. 417—203 3 Claims

A gas turbine driven air compressor system including a first compressor feeding a portion of its compressed air to the turbine for combustion purposes and a second positive displacement compressor receiving the remaining compressed air from the first compressor and boosting its pressure for use as compressed air.

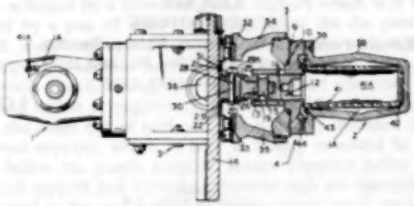


3,640,647

DIAPHRAGM PUMP

Bernard Eaton Hart, Staford, England, assignor to Flexian Hydraulics Ltd., Salisbury, Wilts, England

Filed Jan. 29, 1970, Ser. No. 6,849
Int. Cl. F04b 35/02, 43/10, 45/00
U.S. Cl. 417—389 13 Claims



This disclosure is directed to a diaphragm pump having a crankcase housing to which there is connected a pump casing and a cooperating piston assembly. A flexible, cup-shaped diaphragm is interposed between the pump casing and the piston assembly so that a pumping chamber is formed with the pump casing on one side of the diaphragm and a pressure fluid chamber is formed on the other side of the diaphragm. A means defining a working fluid inlet and outlet is disposed in communication with the pumping chamber, and a means is provided for venting the pressure fluid chamber. In operation the action of the piston assembly on the fluid-filled pressure chamber effects the actuation of the diaphragm member to produce a pumping action on the working fluid.

3,640,648

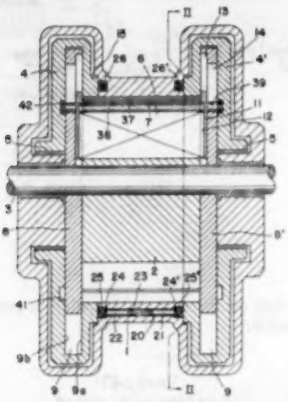
ROTARY MACHINE OF THE BLADE TYPE

Daisuku Odawara, 520, Ueno Shi ba-cho, 5 chome, Sakai-shi, Japan

Filed Apr. 18, 1969, Ser. No. 817,374
Claims priority, application Japan, Apr. 22, 1968, 43/26583; June 28, 1968, 43/44500
Int. Cl. F01c 19/08
U.S. Cl. 418—133 8 Claims

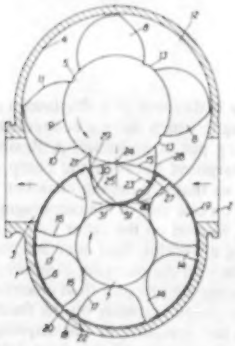
A rotary machine of the blade type including a plurality of blades movably disposed in radial grooves formed in a rotor rotatably mounted in a casing eccentrically thereof and pail-shaped airtight rotors mounted in a casing concentrically

thereof on opposite sides of the rotor in enclosing relationship with the rotor and the blades, which rotor has discal members fixed to opposite sides thereof and being each



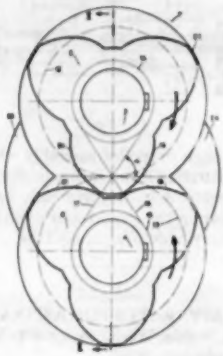
formed with radial grooves for guiding and supporting the blades, and a high-pressure gas producing apparatus comprising a rotary air compressor of the blade type described.

3,640,649
SCREW ROTORS
Jan Edvard Persson, 2 Edinsvagen, Ektorp, Sweden
Filed Sept. 23, 1969, Ser. No. 860,257
Int. Cl. F03c *11/00, 3/00*
U.S. Cl. 418—191 **7 Claims**



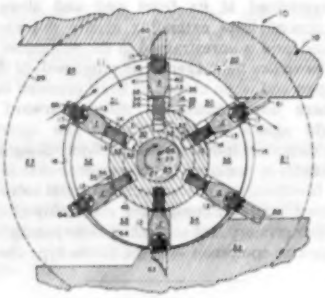
A gate screw rotor forming one part of a set of screw rotors for a screw rotor machine which has a helical sealing ridge at the intersection between a first concavely curved flank of a helical thread and an arcuate crest portion of the profile whereas the said crest portion merges in a second concavely curved flank of the thread with a rounded profile portion. The gate rotor is cut by means of a cutter having blades each one of which cut the entire profile of the threads from the leading side of said crest ridge through the bottom of the groove to the trailing side of the ridge. The main rotor of a screw rotor set for such a machine may be manufactured in similar way.

3,640,650
GEAR TOOTH SYSTEM FOR GEAR PUMPS
Robert Wydler, Zurich, Switzerland, assignor to Maag Gear Wheel & Machine Company Limited, Zurich, Switzerland
Filed July 15, 1969, Ser. No. 841,866
Claims priority, application Germany, July 18, 1968, P 17 03 849.2
Int. Cl. F01c *1/18*
U.S. Cl. 418—206 **1 Claim**



In a gear tooth system for the pumping wheels of a gear pump, having an auxiliary driving transmission, the tooth profiles of the pumping gearwheels are of involute shape, the operational or working pressure angle is greater than 40°, and the transverse contact ratio is approximately 0.5.

3,640,651
INNER VANE FOR ROTARY DEVICES
Harry F. Johnson, Westerville, Ohio, assignor to The Battelle Development Corporation, Columbus, Ohio
Filed Aug. 31, 1970, Ser. No. 68,398
Int. Cl. F04c *1/00, 17/00*
U.S. Cl. 418—269 **11 Claims**



A sliding-vane rotary moving-fluid device. Radially slidable in each rotor slot are an outer vane and a thinner contiguous inner vane. Selected outward pressures on the inner vane and on leading and trailing portions of the outer vane provide proper net pressure distributions for tracking of the outer vane on a cam ring while traversing sealing spaces and port spaces alternately during rotation.

3,640,652

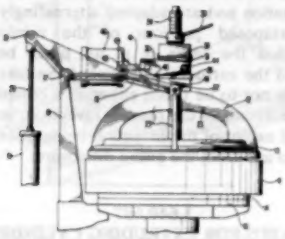
LOCKING DEVICE FOR TIRE RETREADING MOLD

John R. Mattox, Route 3, Box 208-A, Charlotte, N.C., and Thomas W. Mattox, 7205 Morley Circle, Charlotte, N.C.

Continuation-in-part of application Ser. No. 736,783, June 13, 1968, now Patent No. 3,516,121. This application Dec. 4, 1969, Ser. No. 882,058

Int. Cl. B29h 5/04

U.S. Cl. 425—20 5 Claims



A single trunnion mounted power cylinder operates a low-friction wedge horizontally to exert a heavy clamping force along the true axis of the coupling shaft which connects the tire stand and overhead clamping ring or turret. The clamping ring or turret is pressed tightly against the mold matrix resting on the stand. The trunnions for the cylinder are supported on a lower bearing block beneath the wedge.

3,640,653

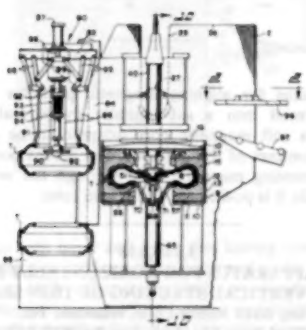
TIRE CURING PRESS

Nicholas M. Laenen, Columbiana, and James M. Cooper, Tallmadge, both of Ohio, assignors to NRM Corporation, Akron, Ohio

Filed June 29, 1970, Ser. No. 50,833

Int. Cl. B29h 5/02

U.S. Cl. 425—33 8 Claims



Upstanding bladder-type tire curing press having a fluid pressure actuated post engaged with the closed upper end of the bladder and having post and bladder pressure controls to facilitate the tire carcass loading, shaping, curing, and unloading operations. The press also has a stationarily mounted stripper with respect to which the cured tire is raised thus to strip the tire from the movable toe ring of the top mold section for discharge onto an unloading conveyor beneath the stripper.

3,640,654

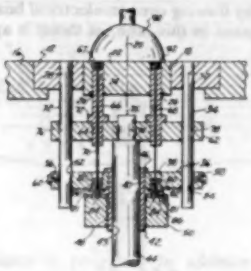
DIE AND PUNCH ASSEMBLY FOR COMPACTING POWDER AND METHOD OF ASSEMBLY

Joseph E. Smith, Birmingham, Mich., assignor to Wolverine-Pentronix, Inc., Lincoln Park, Mich.

Filed June 25, 1970, Ser. No. 49,80[illegible]

Int. Cl. B30b 11/02, 11/06

U.S. Cl. 425—78 37 Claims



A die and punch assembly for use on a powder compacting press for making articles compacted from a powder and a method of assembly. The assembly comprises a die plate appropriately mounted to the press and includes an aperture in which a die bushing is adhesively bonded, the die bushing having one or more cavities, each of which has a punch slidably and snugly disposed therein. The punches are collectively actuated by a common punch support which is in turn carried by a pair of posts extending below the die plate to permit reciprocal movement of the punches within their respective die cavities. A plurality of core rods are provided, with each punch having one end of at least one core rod disposed within a longitudinal bore formed in each punch, while the other end of said core rod is fixedly mounted on a core rod support, which in turn is fixedly mounted to the posts below the punch support. Means disposed below the core rod support and extending therethrough are operatively connected to the punch support to selectively cause reciprocation thereof.

ERRATUM

For Class 425—83 see:
Patent No. 3,640,793

3,640,655

APPARATUS FOR UTILIZING HOT AND COOL GAS FOR THRUST EMBEDDING A METAL INSERT IN A BODY OF HEAT SOFTENABLE MATERIAL

Robert P. Wallace, Somers, N.Y., assignor to Mite Corporation, Danbury, Conn.

Filed Feb. 25, 1970, Ser. No. 14,144

Int. Cl. B29d 3/00

U.S. Cl. 425—109 7 Claims

Apparatus for installing by thrust embodiment a metallic insert into a receiving body of thermoplastic material which is relatively rigid at ambient temperature by softening the thermoplastic where the insert is to be forced in as thrust is applied to the insert. The thermoplastic body is softened at this site by continuously and rapidly flowing of pressurized hot gas or air against this locality of the plastic body and the insert as the latter is progressively thrust forward. The elevated temperature of the gas or air is kept below that which will cause appreciable heat damage of the plastic. When the insert has been inserted to the desired depth it and the adjacent plastic are rapidly cooled to ambient tempera-

ture by pressurized cool gas or air which is flowed rapidly against the embedded insert and the adjacent plastic.

A tool for performing this action includes a housing that is supported in a relatively fixed position. A thrust motor, which may be of the single action spring return pneumatic type, is mounted in the housing, and the piston thereof transmits thrust to the back end of the insert by a tube which has an insert-engaging hollow tip. The tube guides flow therethrough into the hollow tip of pressurized gas or air which is heated by flowing over an electrical heating coil that is coaxially mounted in this tube, as thrust is applied by the

latter to the insert. The hot pressurized gas or air raises the temperature of the insert and adjacent thermoplastic of the receiving body to that which softens the plastic for permitting thrust entry of the insert. The insert is guided during thrust by the tool, and preferably also by a pilot hole formed in the plastic body into which the nose of the insert initially is dropped. After the insert has been thrust into the softened plastic to the desired depth the softened plastic adjacent the insert is rapidly cooled by a blast of pressurized gas or air at ambient temperature which is flow guided into the hollow tip by a duct that is carried alongside of the tube so as to bypass the heating element.

3,640,656

APPARATUS FOR CONTINUOUS MANUFACTURE OF REINFORCED HOSE

Jan J. Boguslawski, New York, N.Y., assignor to Fabric Fire Hose Company, Sandy Hook, Conn.

Filed May 5, 1970, Ser. No. 34,719
Int. Cl. B29d *23/05*
U.S. Cl. 425—113 **19 Claims**

1A	*1B*

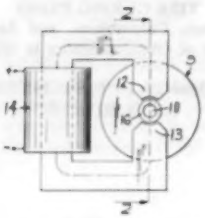
Automatic apparatus for continuously coating a tubular or sleeve-shaped reinforcing carcass for a reinforced hose product with a polymeric material by passing the sleeve uniformly through an extruder, is disclosed. A mandrel extends rearwardly from the extruder to the supply station of the sleeve and is adapted to support the latter internally for longitudinal advancing movement toward the extruder. Two stationary clamping members are located between the supply station and the extruder and are adapted to be closed alternatingly into engagement with the mandrel for selectively inhibiting movement of the sleeve along the mandrel at those locations. Two traveling sleeve accumulators, one arranged for reciprocal linear movement intermediate the two stationary clamping members and one for like movement intermediate the second such member and the extruder, are adapted alternatingly to contact respectively juxtaposed portions of the sleeve and push the same along the mandrel, the first accumulator when the first stationary clamping member is opened and the second one closed, and the second accumulator when the second stationary clamping member is open and the first one closed. Two reciprocally traveling clamping members are located between the extruder and the hose takeup station and are adapted alternatingly to contact respective juxtaposed portions of the reinforced hose product, so that the same is at all times being pulled uniformly from the extruder and toward the takeup station. This abstract is not to be taken either as a complete exposition or as a limitation of the present invention, however, the full nature and extent of the invention being discernible only by reference to and from the entire disclosure.

3,640,657

APPARATUS FOR EXTRUDING CYLINDRICAL MAGNETS

Robert L. Rowe, Sea Gull Hill Road, North Haven, Sag Harbor, N.Y., and Donald Peccerill, 37 Susquehanna Avenue, West Haven, Conn.

Filed Nov. 21, 1967, Ser. No. 684,800
Int. Cl. B29f *3/00*
U.S. Cl. 425—114 **11 Claims**



An apparatus for aligning magnetic particles in a base material formed into a substantially cylindrical member, comprising a soft magnetic core adapted to be positioned within the confines of the member, and means positioned to apply an orienting magnetic field through the walls of the member while it is positioned about said core.

3,640,658

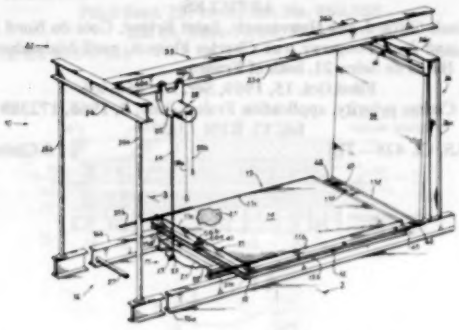
JOBSITE APPARATUS FOR HORIZONTALLY POURING AND VERTICAL STACKING OF THIN SLABS

James H. Price, 6649 Merry Lane, Houston, Tex.

Filed June 12, 1969, Ser. No. 832,722
Int. Cl. B28b *7/08, 7/22*
U.S. Cl. 425—117 **7 Claims**

Apparatus for pouring preferably thin slabs or reenforced concrete of substantial area with a form therearound and light bottom therebelow completing a pan with the pan bottom being supported by a lift frame initially resting upon stationary support runners. The concrete is poured upon reenforcing means in the pan, including an extending bail, and the lift frame is engaged centrally from the outer end together with pan-encased poured slab to dispose such slab leaning against an upright. The upper end and side forms and

the pan bottom may then be recovered, the slab curing in raised position above a lowest form member left thereunder to rest upon the support runners. The bail extending from the



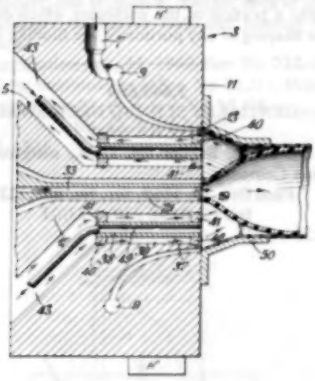
slab upper portion may then be engaged to handle the slab into permanent, predetermined position in a structure, the lowest form member at this time being removed.

3,640,659

SPLIT DIE FOR EXTRUDING LAMINATED TUBING

Dimiter V. Dimitroff, New York, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Filed Aug. 1, 1968, Ser. No. 749,431
Int. Cl. B29d *23/04*
U.S. Cl. 425—133 **6 Claims**



A split die with inner and outer dies having concentrically arranged extrusion orifices. The inner and outer dies being spaced from each other to provide an insulating space whereby a temperature gradient may be maintained between said inner and outer dies during the extrusion process.

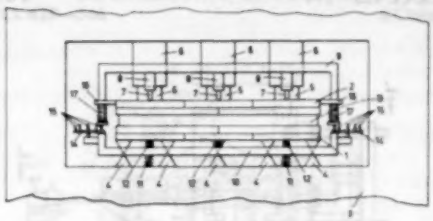
3,640,660

PRESS, PARTICULARLY FOR FORMING FIBER PLATES

Albert De Mets, Hogestraat 105, Kachtem-Izegem, Belgium

Filed Oct. 8, 1968, Ser. No. 765,772
Claims priority, application Belgium, Oct. 10, 1967, 704,898
Int. Cl. B30b *15/24*
U.S. Cl. 425—141 **4 Claims**

A press utilizing two pressure platens provides means for measuring the relative distance between the two pressure platens when the platens are in a closed operative position. A signal is generated indicative of the relative distance between the platens and means for varying the flow of pressurized fluid to one or more cylinder piston assemblies connected to



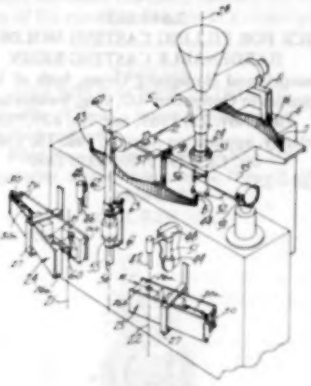
a pressure platen is provided. In addition an adjustable rotatable disc carrying spacing pins is provided which permits the adjustment of the relative position of the upper and lower pressure platens.

3,640,661

CONTINUOUS-PARISON BLOW-MOLDING APPARATUS

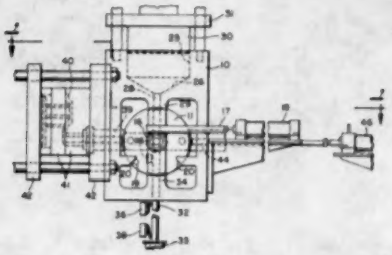
Joseph Gasior, Bloomfield, and Lloyd Kovacs, Somerset, both of N.J., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Oct. 13, 1969, Ser. No. 870,441
Int. Cl. B29d *23/03*
U.S. Cl. 425—159 **13 Claims**



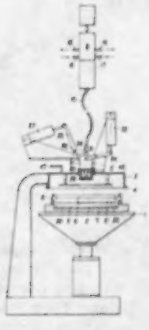
Apparatus utilizing an extruder capable of moving in such a manner as to dispose a parison momentarily, selectively, and concurrently with a cutting operation, within each of a plurality of molding stations. Each station is occupied by a blow mold having halves which part and close during a cycle in which a section of the parison is received, severed, and blow molded therewithin. Essential to processing the parison is the movement of the extruder die along a sinuous path along which the die is rapidly withdrawn in a direction opposite to that of parison travel during and after severance of the parison section received in a mold.

3,640,662
INJECTION MOLDING MACHINE WITH HIGH-FREQUENCY DIELECTRIC HEATER
William H. Schwartz, University Heights, Ohio, assignor to Lester Engineering Company, Cleveland, Ohio
Filed Dec. 23, 1969, Ser. No. 868,726
Int. Cl. B29f 1/08
U.S. Cl. 425—174 4 Claims



A system for dielectrically heating primarily glass fiber filled polyester materials in an indexing-type injection molding machine. The machine is indexable between a shot-receiving and shot-ejecting position and several forms of dielectric apparatus are shown for heating the shot to achieve a partial cure in one or more of these positions, or in an advance-receiving arrangement. In at least one species of the invention correlation between position of the shot in the molding machine and operation of the dielectric heater is automatically effected to achieve a high efficiency of operation. A system for controlling the operational steps of the molding machine is disclosed, a portion of the sequencing being dependent upon a predetermined level of heating of the shot material.

3,640,663
DEVICE FOR FILLING CASTING MOLDS WITH HARDENABLE CASTING RESIN
Gerald Hampel, and Hansgeorg Gruss, both of Vienna, Austria, assignors to Optipatent AG, Zug, Switzerland
Filed Nov. 25, 1969, Ser. No. 879,793
Claims priority, application Austria, Feb. 18, 1969, 1640/69
Int. Cl. B29c 5/00; B29f 1/00
U.S. Cl. 425—233 4 Claims

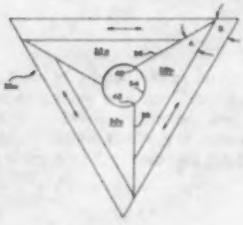


A device and means for supplying high clamping pressure to split molds. The molds are mounted in side cover plates on elastic mountings. The cover plates can be clamped closed by simple clamping devices such as hooks. This elastic mounting eliminates the more complex clamping systems used when the split molds are directly clamped.

3,640,664
SHAPING MOLDS FOR PRODUCING FILMLIKE ARTICLES
Louis Giffard, rue Houvenagle, Saint Brieuc, Cote du Nord 5, and Jean Fougeray, rue Charles Floquet, rueil Malmaison, Hauts de Seine 21, both of France
Filed Oct. 15, 1969, Ser. No. 866,466
Claims priority, application France, Nov. 4, 1968, 172389
Int. Cl. B29c 13/00
U.S. Cl. 425—275 2 Claims

A shaping mold for producing filmlike articles by the fluidization process, this mold consisting of a completely closed enclosure formed in a metallic material having good heat-conducting properties but a reduced thickness. The enclosure communicates with the surrounding free atmosphere, during the heating thereof, via at least one tube carried by an opening into a portion of the enclosure which does not partake in the shaping of any portion of the filmlike article.

3,640,665
TANGENTIALLY SLIDING NECK SWAGING MECHANISM
Charles L. Seefluth, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Dec. 19, 1969, Ser. No. 886,722
Int. Cl. B29d 23/04, 23/03
U.S. Cl. 425—297 3 Claims



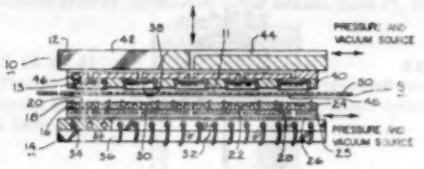
Apparatus for forming a large diameter parison or the like into a smaller diameter neck area of the like comprises at least three swaging jaws adapted to slide in a generally tangential relationship to the material being formed, adjacent jaws being in sliding contact with each other.

3,640,666

TRIM IN PLACE THERMOFORMING APPARATUS

Bruce T. Jope, South Glastonbury, Conn., and Alan R. Phillips, Monson, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 25, 1969, Ser. No. 860,888
Int. Cl. B29c 17/04, 17/08
U.S. Cl. 425—302 1 Claim



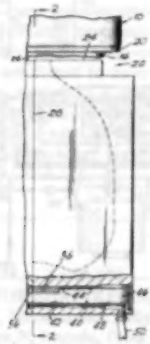
Apparatus for trim in place thermoforming of flanged containers from successive portions of a continuous sheet. The blade in the forming press for sealing each sheet portion during forming and for substantially severing each container from the sheet is integral with and on the same side of the sheet as the means for heating the sheet, and therefore is itself in a heated condition. This reduces the sharpness of and positions a troublesome edge at the lower surface of the container flange. Each mold may have a rounded nose portion for shaping a downturned flange as the container body is formed.

3,640,667

APPARATUS FOR BLOW MOLDING HOLLOW ARTICLES

Samuel J. Rupert, and William E. Ziegler, both of Ann Arbor, Mich., assignors to Hoover Ball and Bearing Company, Saline, Mich.

Original application Apr. 22, 1968, Ser. No. 722,978, now abandoned, for continuation of Ser. No. 22,211. Divided and this application Feb. 24, 1970, Ser. No. 13,275
Int. Cl. B29d 23/03
U.S. Cl. 425—326 5 Claims



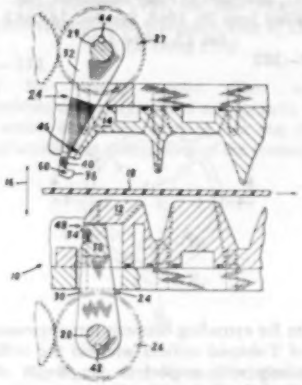
Blow molding apparatus for forming hollow plastic articles from blanks in which the articles are of shapes which make it desirable to partially inflate the blanks prior to blowing to final form in order to realize best blow molding results. Mold apparatus to provide wherein the blanks are partially inflated as an incident to their formation in the enclosing mold sections.

3,640,668

REENTRANT FORMING APPARATUS

Fred P. Brown, Jr., Centerville, and Howard A. Rohdin, Waquoit, both of Mass., assignors to Packaging Industries, Inc., Hyannis, Mass.

Filed July 24, 1969, Ser. No. 844,305
Int. Cl. B29c 17/00; B29d 27/00
U.S. Cl. 425—346 4 Claims



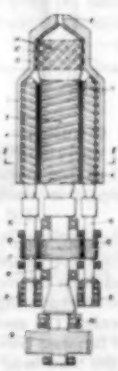
A pair of dies engage a sheet of heat-softened foamed polystyrene plastic at a forming station and form it into a desired shape such as a carton. At the same station, and while the plastic is held between the dies, a portion of the plastic protruding from the dies is engaged on opposite sides by cooperating punches to impart a reentrant formation to the plastic that the dies alone could not impart. The reentrant formation facilitates releasably latching the top and bottom portions of the completed carton in a closed position.

3,640,569

MULTIPLE-SCREW EXTRUDER

Wilhelm Hanslik, Vienna, Austria, assignor to Dorplastex A.G., Zug, Switzerland

Filed Nov. 5, 1969, Ser. No. 874,236
Claims priority, application Austria, Nov. 18, 1968, A 11202/68
Int. Cl. B29f 3/02
U.S. Cl. 425—376 10 Claims



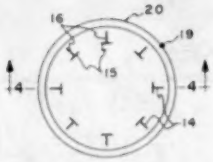
A multiple-screw extruder which has a central feed screw meshing with two or more outer screws uniformly spaced

around the circumference of the central screw, its outer screws having a mean thread diameter equal to a mean thread diameter of the central screw divided by the number of outer screws.

3,640,670
SPINNERETTE FOR EXTRUDING T-SHAPED FILAMENTS

Paul Paliyenko, Charlotte, and Werner E. Beier, Matthews, both of N.C., assignors to Fiber Industries, Inc.

Filed June 20, 1968, Ser. No. 745,652
Int. Cl. D01d *3/00*
U.S. Cl. 425—382 **8 Claims**

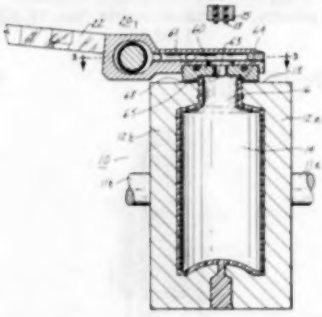


Spinnerette for extruding filament-forming material having a plurality of T-shaped orifices wherein the orifices are arranged annularly with respect to the center of the spinnerette. Each of the T-shaped orifices comprises a crossbar and a stem extending perpendicularly from the crossbar at its midpoint with the stem facing away from the center of the spinnerette. Further embodiments of the spinnerette include a split T-configuration and the method of spinning T-cross-section filaments.

3,640,671
APPARATUS FOR VENTING AND RELEASING PLASTIC ARTICLES FROM A BLOW MOLD

Joseph R. Reilly, Naugatuck, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 26, 1969, Ser. No. 802,539
Int. Cl. B29c *17/07;* **B29d** *23/03*
U.S. Cl. 425—387 **5 Claims**

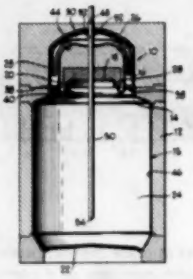


In a blow-molding machine, a blow head assembly which includes a housing having valve means therein for rapidly exhausting the blowing gas from the mold cavity after formation of the article without withdrawing the assembly from registry with the mold opening. The assembly also may include a recessed blow head to facilitate removing the blown article from the mold. Use of the blow head involves establishing a seal therein with an end portion of the parison during blowing which is broken by the opening movement of the mold sections to permit the article to fall cleanly away from the mold.

3,640,672
APPARATUS FOR FORMING A CONTAINER WITH AN INTEGRALLY FORMED HOLLOW HINGED HANDLE

Anthony J. Starr, 1412 Lovering Avenue, Wilmington, Del.

Filed Aug. 25, 1969, Ser. No. 871,511
Int. Cl. B29c *17/07;* **B29d** *23/03*
U.S. Cl. 425—387 **1 Claim**

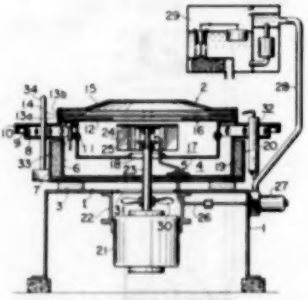


Apparatus for forming a container from a blow-moldable plastic, and characterized by a hollow handle hingedly connected to a container body. The apparatus includes a tube having a pair of openings, one for blowing the container body, and the other for blowing the handle in a simultaneous operation. This is achieved by introducing the mold parison between the mold halves, part of the parison forming the container body and the other part forming the handle.

3,640,673
LIQUID FUEL BURNER

Kenya Okamoto, and Hajime Satoda, both of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 20, 1970, Ser. No. 56,257
Claims priority, application Japan, July 22, 1969, 44/59581; 44/59582; 44/71657; 44/71659
Int. Cl. F23d *11/04*
U.S. Cl. 431—168 **9 Claims**



A liquid fuel burner so constructed that a Silocco fan is disposed in a gasification chamber of the burner and an atomizer utilizing the effect of centrifugal force is provided in the center or air-sucking portion of said Silocco fan, whereby a liquid fuel supplied to the atomizer is dispersed radially outwardly under the influence of centrifugal force in the form of particles and further divided into fine particles by the stirring and dispersing actions of the blades of said Silocco fan, said fine particles of liquid fuel being gasified by heated air.

CHEMICAL

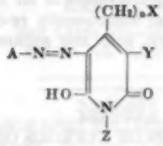
3,640,674

PROCESS FOR COLORING SYNTHETIC TEXTILE MATERIALS WITH MONOAZO DYESTUFF DISPERSION

Alistair Howard Berrie, and Nigel Hughes, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 23, 1969, Ser. No. 835,776
Claims priority, application Great Britain, June 27, 1968, 30,759/68
Int. Cl. C09b 29/22
U.S. Cl. 8—41 4 Claims

Process for coloring synthetic textile materials with an aqueous dispersion of a water-insoluble monoazo dyestuff, of the formula:



wherein A is an unsubstituted or substituted aryl radical; *n* is 0 or 1; Z is an unsubstituted or substituted alkyl or aryl radical; X and Y are each independently hydrogen, unsubstituted or substituted alkyl or aryl or —CN, —COOR, —COR and —CONR¹R² wherein R is unsubstituted or substituted alkyl or aryl and R¹ and R² each independently represent hydrogen or unsubstituted or substituted alkyl or aryl.

3,640,675

PREPARING PERMANENT PRESS GARMENTS BY TREATING WITH COMPOSITION THEREFOR

Manuel A. Thomas, 716 Palmetto St., Spartanburg, S.C.

Filed Feb. 19, 1968, Ser. No. 706,605
Int. Cl. D06m 15/28, 15/50
U.S. Cl. 8—115.6 10 Claims

A fabric having been impregnated with a composition comprising a neoprene elastomer, a polyisocyanate, polyisothiocyanate, blocked derivatives and mixtures thereof, and a metal oxide are found to have a propensity for subsequent durable dry setting in a preselected configuration. Fabrics which have been prepared and set in this manner exhibit improved crease retention, flat dry stability and resistance to shrinkage even when subjected to home laundering operation.

3,640,676

PROCESS FOR SHRINKPROOFING WOOL

William J. McKillip, Minneapolis; Billy M. Culbertson, Burnsville, and Clarence N. Impola, Prior Lake, all of Minn., assignors to Ashland Oil, Inc., Houston, Tex.

Filed Oct. 10, 1969, Ser. No. 865,494
Int. Cl. D06m 3/02
U.S. Cl. 8—127.6 10 Claims

Linear addition polymers having multiple N, N-ethylene ureido functionality are employed to impregnate a wool or wool-containing substrate to provide a treated substrate exhibiting excellent dimensional stability characteristics.

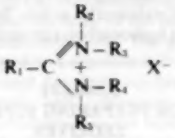
3,640,677

PROCESS FOR DYEING FIBRE MATERIALS OF POLYACRYLONITRILE OF ACRYLONITRILE-CONTAINING COPOLYMERS

Klaus Walz, Leverkusen-Wiesdorf; Walter Hees, Koeln-Hoehenhaus, and Mathieu Quaedvlieg, Opladen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 28, 1969, Ser. No. 794,804
Claims priority, application Germany, Feb. 9, 1968, F 54782
Int. Cl. D06p 3/70
U.S. Cl. 8—172 2 Claims

Process for dyeing textile fiber materials of polyacrylonitrile or copolymers of acrylonitrile with cationic dyestuffs which comprises carrying out the dyeing in the presence of amidinium compounds of the formula



wherein R_1, R_2, R_3, R_4 and R_5 are, independently of one another, hydrogen, an optionally substituted alkyl, cycloakyl, aralkyl or aryl group; R_2 may form with R_1 or R_3 and/or R_4 with R_5 a heterocyclic ring, and X^- is an anion.

3,640,678

YTTRIUM PURIFICATION PROCESS

Carter H. Trimble, and David B. Strott, both of Lakewood, Colo., assignors to Molybdenum Corporation of America, New York, N.Y.

Filed June 1, 1970, Ser. No. 42,045
Int. Cl. C22b 59/00
U.S. Cl. 23—22 17 Claims

Pure yttrium values are isolated continuously from aqueous solutions of yttrium and rare earth values in a two or three circuit liquid—liquid extraction system using an amine extractant in one circuit to remove lower atomic number rare earth values and a (halodi- or trialkyl)alkanoic acid extractant in the other circuit or circuits to remove higher atomic number rare earth values. Efficiency is enhanced by using a salting out agent in the amine extractant circuit and separating the yttrium values from the salting out agent by extraction in an intermediate carboxylic acid extractant circuit.

3,640,679

PROCESS FOR RECOVERY OF COLUMBIUM

Albert E. Erhard, Denver, and Jack B. Allison, Lakewood, both of Colo., assignors to Molybdenum Corporation of America, New York, N.Y.

Continuation-in-part of application Ser. No. 797,265, Feb., 1969, now abandoned. This application Dec. 17, 1969, Ser. No. 885,965
Int. Cl. C22b 59/00
U.S. Cl. 23—15 R 13 Claims

An improved process for recovery and purification of columbium values from columbium concentrates or ores comprises either (I) baking a concentrate with sulfuric acid; aqueously leaching the acid-baked concentrate; and fixing or conditioning the leached concentrate with ammonia or an al-

kali metal hydroxide; or (II) heating and fixing the concentrate with an excess of an alkali metal hydroxide; aqueously leaching the products of Steps (I) or (II) to produce an aqueous solution containing fixed columbium values and recovering the columbium values from the solution.

3,640,680

METHOD OF DECREASING THE POTASSIUM CONTENT OF POTASSIUM-CONTAINING ZEOLITES

George T. Kokotailo, Woodbury, and Stephen L. Lawton, Sewell, both of N.J., assignors to Mobil Oil Corporation

Filed Oct. 28, 1968, Ser. No. 771,701
Int. Cl. C01b *33/28*
U.S. Cl. 23—111 **3 Claims**

A method of decreasing the potassium content of a potassium zeolite containing calcium, such as erionite, which comprises calcining said zeolite and thereafter ion exchanging said zeolite with cations other than potassium. Potassium zeolites, such as zeolite-T, which do not contain calcium are ion exchanged with calcium cation prior to said calcining and ion exchanging. Catalytically active forms of the zeolite product are used in hydrocarbon conversion processes.

3,640,681

PROCESS FOR PREPARING SUPERSILICEOUS ZEOLITES

Paul Eugene Pickert, Katonah, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 17, 1969, Ser. No. 885,981
Int. Cl. C01b *33/28*
U.S. Cl. 23—111 **8 Claims**

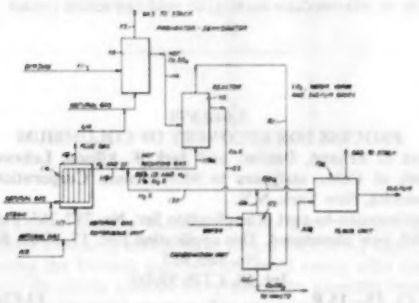
Framework aluminum is extracted from crystalline zeolitic molecular sieves, using acetylacetone as the extracting agent. Prior to contact with the acetylacetone, the zeolite must be rendered substantially cation-deficient and be at least partially dehydroxylated. Other metal values can be substituted for the framework aluminum by contacting the zeolite either before or after acetylacetone extraction with a metal acetylacetonate. The products are useful hydrocarbon conversion catalysts.

3,640,682

INCREASING THE RATE OF REACTION IN REDUCING CALCIUM SULFATE TO CALCIUM SULFIDE

Jay Charles Smith, Gretna, and James R. Reinhardt, New Orleans, both of La., assignors to Freeport Sulphur Company, New York, N.Y.

Filed Jan. 8, 1970, Ser. No. 1,521
Int. Cl. C01b *17/44, 17/42*
U.S. Cl. 23—137 **16 Claims**



Method for increasing the rate of reduction of calcium sulfate to calcium sulfide in which calcium sulfate is reduced to calcium sulfide by a reductant such as hydrogen, carbon monoxide, coke, or hydrocarbons; the rate of reaction being increased by the addition of a small amount of an accelerator agent, comprising sulfur, sulfur dioxide, a sulfur compound which will generate sulfur vapor, or a gaseous sulfur such as sulfur dioxide which will react or decompose to generate sulfur vapor or gaseous sulfide.

3,640,683

METHOD OF PREPARING MANGANESE DIOXIDE FOR DRY CELL

Kazuhide Miyazaki, and Seiichi Tozawa, both of Tokyo, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1969, Ser. No. 847,947
Claims priority, application Japan, Jan. 28, 1969, 44/5692
Int. Cl. C01g *45/02;* **H01m** *15/00*
U.S. Cl. 23—145 **5 Claims**

This invention relates to a method of preparing manganese dioxide with excellent battery performances, wherein naturally occuring manganese dioxide ores are employed as starting material and partially converted in air or oxygen at an elevated temperature and subsequently re-oxidized with a mixed solution of sulfuric acid and sodium or potassium chlorate.

3,640,684

PREPARATION OF CUPROUS OXIDE

Lawrence C. Klein, Hubbell, Mich., and Laurence G. Stevens, Des Plaines, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 13, 1970, Ser. No. 2,671
Int. Cl. C01g *3/02;* **C22b** *3/00*
U.S. Cl. 23—147 **6 Claims**

Preparing cuprous oxide from an aqueous cuproammonium solution containing cuprous and cupric ions by contacting the solution with an ion exchange resin in which cupric ions are retained and cuprous ions are not. The raffinate passing through the ion exchange resin is withdrawn and heated to evolve ammonium ions and to form cuprous oxide. The cuprous oxide then is recovered by filtering and drying.

3,640,685

METHOD OF PRODUCING FLUOSILICIC ACID OF LOW PHOSPHORUS CONTENT FROM WASTE GASES

Heinz Goller, Linz am Danube, Austria, assignor to Osterreichische Stickstoffwerke Aktiengesellschaft, Linz am Danube, Austria

Filed Apr. 6, 1970, Ser. No. 26,165
Claims priority, application Austria, Apr. 8, 1969, A 3370/69
Int. Cl. C01b *7/00, 33/08, 7/22*
U.S. Cl. 23—153 **2 Claims**

The hot waste gases obtained from crude phosphate digestion in the manufacture of superphosphate were diluted with eight to 12 times their volume of air and the sludge droplets and the crude phosphate dust were then separated in a cyclon with a limiting particle size of at most 0.01 mm. before eluting the H_2SiF_6 with water.

3,640,686

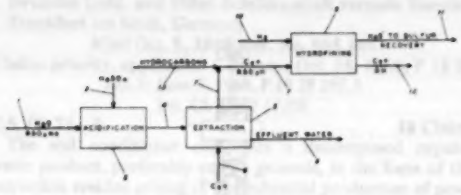
WASTE WATER PURIFICATION

Robert A. Farnham, 21 Valleystone Drive, San Rafael, Calif.

Filed Nov. 2, 1970, Ser. No. 86,163
Int. Cl. C01b *17/16;* **C01g** *23/02*
U.S. Cl. 23—181 **3 Claims**

A process for purifying an aqueous stream contaminated with organic sulfonate salts having a carbon number of at least four and for producing purified oil and H_2S which process comprises contacting the aqueous stream with an acid to convert the organic sulfonate salt to an organic sulfonic acid, extracting the organic sulfonic acid from the aqueous stream by contacting the aqueous stream with a C_6+ hydrocarbon to obtain a contaminated C_6+ hydrocarbon stream containing the organic sulfonic acid, and hydrofining

the contaminated C_4+ stream by contacting the stream, at a temperature between 450° and 900° F. and in the presence of



added hydrogen gas, with a hydrofining catalyst. The process can also be applied to aqueous streams containing naphthenate salts.

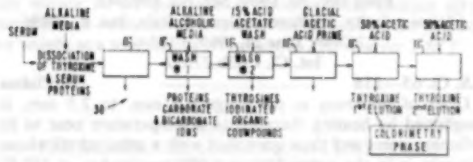
ERRATUM

For Class 23—209 see:
Patent No. 3,639,953

3,640,687
CHROMATOGRAPHY METHOD AND APPARATUS

Ronald B. Smernoff, Belmont, Calif., assignor to Oxford Laboratories, San Mateo, Calif.

Filed July 23, 1969, Ser. No. 844,116
Int. Cl. G01n *31/04, 33/16*
U.S. Cl. 23—230 B 10 Claims

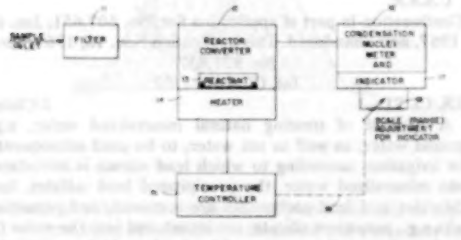


A chromatographic method and apparatus for serum thyroxine iodine determination including sealed ion exchanged resin column structures which are opened and press fit and sealed to funnel members for use and a method in which serum protein is removed from resin bound thyroxine in alkaline solution, with a pH of substantially 8.

3,640,688
CARBON MONOXIDE MEASURING METHOD AND DEVICE

Eric G. Walther, Jonesville, N.Y., assignor to Environment/One Corporation, Latham, N.Y.

Filed Sept. 15, 1969, Ser. No. 857,741
Int. Cl. G01n *1/00, 31/02*
U.S. Cl. 23—232 R 16 Claims



A method and apparatus for measuring trace amounts of carbon monoxide in a sample gas. The technique comprises filtering a specimen portion of a sample gas to free it of condensation nuclei. The filtered, carbon monoxide-bearing gas specimen is then reacted with a polymer to induce thermoparticulate production of consideration nuclei from the polymer. To enhance the thermoparticulate production of the condensation nuclei, the polymer is heated to a temperature value just below that required for appreciable thermoparticulate production due to thermal agitation alone. In the presence of carbon monoxide, thermoparticulate production of condensation nuclei is enhanced and proves a measure of quantity of carbon monoxide present in the gaseous specimen. By suitably controlling the temperature to which the polymer is heated the CO-measuring device can be made sensitive to a wide range of carbon monoxide concentration. A preferred apparatus in accordance with the invention includes a scale range changing arrangement for adapting the indicator of the condensation nuclei meter to operate over a wide range of particle concentrations together with means for simultaneously operating the scale range changing function with changes in temperature of the reactant polymer whereby for increasing CO concentrations the reactant temperature is lowered and the scale of the indicator is adjusted to read higher CO concentrations. The polymeric material which may be employed as a reactant is from the group consisting of styrene divinyl benzene copolymer, polyethylene, chlorinated polystyrene and copolymer of styrene. The polymeric material preferably is in the form of finely divided, globular beads and the filtered, CO-bearing gas specimen to be reacted is passed over the surface of the beads in a manner to maximize surface exposure of the polymeric material to the gas specimen.

3,640,689
COMPOSITE HARD METAL PRODUCT

Frederick A. Glaski; Robert A. Holzl, and Richard B. Kaplan, all of Pacoima, Calif., assignors to Fansteel Inc., North Chicago, Ill.

Filed Mar. 4, 1970, Ser. No. 16,349
Int. Cl. B32b *15/04*
U.S. Cl. 29—195 6 Claims

A method of chemical vapor deposition (CVD) of a hard layer on a substrate such as cemented tungsten carbide and the product resulting from such method; the method involves a more rapid and more easily controlled CVD of a hard metal such as titanium carbide, by providing an intermediate layer of a refractory interface barrier such as refractory metal on the cemented carbide materials to prevent deleterious interaction between the substrate and the hard metal layer and to obtain a hard wear surface with good composite strength characteristics and bond to the substrate; the product is the resulting composite substrate with the interface metal and the face metal.

3,640,690
WELDED STEEL ARTICLES BONDED BY A STEEL ALLOY

Gerald D. Ries, Barberton, and Sidney W. Poole, Broadview Heights, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation-in-part of application Ser. No. 525,348, Feb. 7, 1966, now abandoned. This application Nov. 21, 1968, Ser. No. 777,880
Int. Cl. B32b *15/00*
U.S. Cl. 29—196.1 2 Claims

Alloy steel welding wire is disclosed as being suitable for welding steels having the composition 0.18 to 0.30 percent carbon, 7.0 to 9 percent nickel, 3.5 to 4.5 percent cobalt, 0.35 to 1.10 percent each of the chromium and molybdenum, 0.10 to 0.35 percent manganese, 0.6 to 0.12 percent vanadium, up to 0.1 percent silicon, up to 0.010 percent each of sulfur and phosphorus, balance iron except for extraneous impurities within commercial tolerances. The alloy steel welding wire has the composition of 0.15 to 0.20 per-

cent carbon, 7.0 to 8.0 percent nickel, 3.0 to 5.0 percent cobalt, 0.5 to 1.0 percent chromium, 0.8 to 1.1 percent molybdenum, 0.4 to 1.25 percent manganese, 0.10 to 0.50 percent silicon, up to 0.1 percent vanadium, up to 0.015 percent each of phosphorus and sulfur, up to 0.05 percent aluminum, up to 0.05 percent of metal of the group titanium and zirconium, balance iron except for impurities within commercial tolerances.

ERRATUM

For Class 41—1 see:
Patent No. 3,640,016

3,640,691

ENHANCING LOW-TEMPERATURE FLOW PROPERTIES OF FUEL OIL

Stephan Ilnyckyj, Islington, Ontario; John Charles O. Cole, Sarnia, Ontario, both of Canada; Nicholas Feldman, Woodbridge, and Barney R. Strickland, Westfield, both of N.J., assignors to Esso Research and Engineering Company

Filed Sept. 17, 1968, Ser. No. 760,347
Int. Cl. C10l *1/16, 1/18, 1/22*
U.S. Cl. 44—62 **7 Claims**

The response of a middle distillate petroleum fuel oil, boiling within the range of about 250° to about 670° F. at atmospheric pressure and containing normal paraffinic hydrocarbons within the range of about n-decane and n-hexacosane to the addition of a flow-improving additive such as a copolymer of ethylene, is improved by adding to the fuel oil a paraffinic distillate fraction, obtained from a crude petroleum, the said fraction boiling at atmospheric pressure within the range of about 450° to about 950° F. and containing normal paraffins higher than n-hexacosane and as high as n-tetracontane, $C_{40}H_{82}$.

3,640,692

STABILIZED DISTILLATE HYDROCARBON FUEL OIL COMPOSITIONS AND ADDITIVES THEREFOR

Marvin S. Rakow, and Robert J. Konig, both of East Brunswick, N.J., assignors to Cities Service Oil Company, Tulsa, Okla.

Filed Oct. 29, 1969, Ser. No. 872,374
Int. Cl. C01l *1/18, 1/22*
U.S. Cl. 44—63 **5 Claims**

A stabilized distillate hydrocarbon fuel oil composition comprising a major proportion of a distillate hydrocarbon fuel and a minor proportion of a stabilizer comprising (a) an additive selected from the group consisting of (1) an amide plus a Schiff base; (2) an amide containing a Schiff base group; and (3) an amide containing a Schiff base group in combination with either an amide or a Schiff base; and (b) a cyclohexylamine. The additives of the invention are useful in stabilizing distillate hydrocarbon fuels such as No. 2 fuel oils, diesel fuels, and jet fuels.

3,640,693

METHOD OF FORMING SILICON COMPOUND FIBERS

Francis S. Galasso, Manchester, and Richard D. Veltri, East Hartford, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 3, 1969, Ser. No. 795,783
Int. Cl. C03b *37/00*
U.S. Cl. 65—2 **8 Claims**

A process for producing low-density high-modulus fibers including the steps of inserting silicon metal, preferably in powdered form, in a glass tube to form a composite, vacuum casting to melt the silicon metal in the tube, drawing the resulting glass-silicon composite rod into a fiber having a filamentary silicon core and an outer glass sheath, removing the

glass sheath and contacting the exposed silicon core with a suitable reactant to form a silicon compound fiber.

3,640,694

METHOD OF TOUGHENING GLASS IN AN OIL BATH

David George Giddings, Stourbridge, and Douglas Twist, Hollywood, near Birmingham, both of England, assignors to Pilkington Brothers Limited, Liverpool, England

Filed Dec. 30, 1969, Ser. No. 889,341
Claims priority, application Great Britain, Jan. 8, 1969, 1,263/69; June 24, 1969, 3,195/69
Int. Cl. C03b *27/00*
U.S. Cl. 65—116 **10 Claims**

Glass of thickness in the range 0.5 mm. to 2.5 mm. is toughened by heating the glass to a temperature near to its softening point and then quenched with a selected oil whose viscosity is in the range 300 to 1,000 centistokes at 38° C. and whose flash point is in the range 220° to 310° C., whilst maintaining the temperature of the oil in the range 150° to 240° C. There is thereby induced in the glass a ratio of surface compressive stress to central tensile stress in the range 1.5:1 to 3.5:1.

ERRATUM

For Class 65—134 see:
Patent No. 3,640,093

3,640,695

METHOD OF TREATING MINERALIZED WATER

Boris Iosifovich Minkevich, ulitsa Musy Dzhalya, 3, Tashkent, U.S.S.R.

Continuation-in-part of application Ser. No. 607,651, Jan. 6, 1967, now abandoned. This application Nov. 18, 1969, Ser. No. 877,837
Int. Cl. A01n *7/02*
U.S. Cl. 71—1 **2 Claims**

A method of treating natural mineralized water, e.g., ground water, as well as sea water, to be used subsequently for irrigation, according to which lead nitrate is introduced into mineralized water, the precipitated lead sulfates, lead chlorides and lead carbonates are removed, and potassium salts e.g., potassium silicate, are introduced into the water for binding the small amounts of lead salts which remain dissolved in the water. All the precipitated lead salts are collected and regenerated for obtaining lead nitrate.

3,640,696

SOIL CONDITIONER AND GARDEN MOLD ON THE BASIS OF COFFEE EXTRACTION RESIDUE

Gerhard Goldmann, Buchschlag, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Oct. 9, 1969, Ser. No. 865,146
Claims priority, application Germany, Oct. 15, 1968, P 18 03 103.3; June 9, 1969, P 19 29 195.3
Int. Cl. C05f *11/08*
U.S. Cl. 71—9 18 Claims

The soil conditioner comprises a decomposed organic waste product, preferably coffee grounds, in the form of the extraction residue arising in the industrial production of powdered coffee, together with finely divided natural or synthetic activated silicon dioxide or a material containing the same.

The material is made by subjecting the coffee ground extraction residue to fermentation in a closed tank and then adding the silicon dioxide followed by storage upon access to the open air. The silicon dioxide may also be added prior to placing the material in the fermentation tank.

3,640,697

NONCAKING, GRAINED AMMONIUM NITRATE

Emory Earl Toops, Jr., Terre Haute, Ind., assignor to Commercial Solvents Corporation, New York, N.Y.

Filed Apr. 16, 1969, Ser. No. 816,815
Int. Cl. C05c *1/02*
U.S. Cl. 71—27 1 Claim

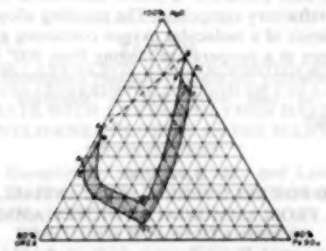
A process for the preparation of noncaking, grained ammonium nitrate by effecting the graining of molten ammonium nitrate in the presence of moisture and sodium alkyl naphthalene sulfonate in a ratio of about 0.01 to 0.1 percent by weight at a temperature from about 230° to over 300° F.

3,640,698

FERTILIZER UREA SOLUTIONS CONTAINING MICRONUTRIENTS

Peter Stanley Backlund, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Mar. 19, 1970, Ser. No. 20,995
Int. Cl. C05c *9/00*; C05b *17/00*
U.S. Cl. 71—29 14 Claims



A fertilizer solution for treatment of plants and soils to correct micronutrient deficiencies is disclosed and comprises an aqueous urea solution having an acidic pH value, less than 4, and containing the sulfate salts of iron, zinc or manganese. An aqueous urea-micronutrient solution containing potassium and phosphorous is also disclosed.

3,640,699

3,5-DISUBSTITUTED BENZAMIDES

Bruce W. Horrom, Waukegan; Aldo J. Crovetti, Lake Forest, both of Ill., and Kenneth L. Viste, Warminster, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Original application Oct. 2, 1967, Ser. No. 671,946, now Patent No. 3,534,098, Continuation-in-part of application Ser. No. 608,271, Jan. 10, 1967, now abandoned. Divided and this application Mar. 3, 1970, Ser. No. 16,249
Int. Cl. A01n *9/20*
U.S. Cl. 71—118 11 Claims

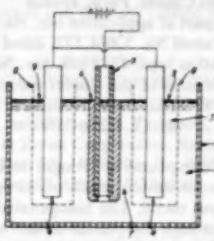
Herbicidal compositions containing as the active ingredient a member of the class of N-(1,1-dimethylpropynyl)-3,5-disubstituted benzamides and a method for controlling undesirable plant growth with them.

3,640,700

PROCESS FOR PRODUCING AN INGOT OF CHROMIUM METAL OR CHROMIUM-BASE ALLOY

Kenzo Suzuki, Kumagaya, and Seiya Sasaki, Yamagata, both of Japan, assignors to Riken Piston Ring Ind. Co., Ltd. and Tekkosha Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1970, Ser. No. 68,363
Int. Cl. C23b *7/02*, *7/00*, *5/52*
U.S. Cl. 75—10 C 22 Claims



A process for producing an ingot of chromium metal or chromium-base alloy having a low content of impurities, such as hydrogen, nitrogen, oxygen, carbon, phosphorus, sulfur, and the like, in which an aqueous solution containing chromium salt is electrolyzed using as the cathode a metal material formed in a predetermined shape, such as circular, elliptical, rectangular or the like in horizontal cross section, to electrodeposit chromium on said metal material. The metal material, if desired, may be removed by chemical dissolution or heat melting after the electrolysis. The thus obtained chromium metal of the predetermined shape may be used as a consumable electrode. Additional materials are filled into the electrodeposited chromium metal which can be either free of the metal material used as the cathode or not free of the same. The chromium metal filled with the additional material is heated to sinter same under a reduced (vacuum) pressure or in a hydrogen atmosphere. A consumable electrode of chromium metal or chromium base alloy is thereby obtained. A high purity chromium metal ingot or chromium base alloy ingot is produced using the thus obtained consumable electrode by consumable-electrode-melting in a water-cooled metal crucible.

3,640,701

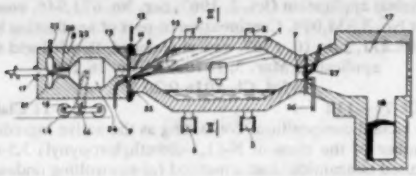
DIRECT REDUCTION OF OXIDES

Jean Bouchet, Clery-Saint-Andre, France, assignor to Creusot-Loire, Paris, France

Continuation of application Ser. No. 454,079, May 7, 1965, now abandoned. This application July 7, 1969, Ser. No. 852,142
Claims priority, application France, Apr. 30, 1964, 973121; July 16, 1964, 981930; July 21, 1964, 982484; Feb. 25, 1965, 6991
Int. Cl. C21b *11/06*
U.S. Cl. 75—40 3 Claims

Metal oxides difficult to reduce are reduced in a rotating furnace heated by a short flame having a temperature of at

least 1,900° C. produced by converting a gaseous hydrocarbon into carbon monoxide and hydrogen by partial combustion with oxygen at about 1,250° C. The carbon monoxide



and hydrogen are burned in a furnace in a jet of oxygen directed toward the top of the furnace at about 1,900° C. producing carbon dioxide and water with release of heat.

3,640,702

METHOD OF IMPROVING THE PROPERTIES OF A FERROUS METAL IN THE MOLTEN STATE

Pierre Karinthi, Champigny-sur-Marne, France, and Etienne Spire, Montreal, Canada, assignors to L'Air Liquide, Societe Anonyme pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Continuation-in-part of application Ser. No. 581,920, Sept. 22, 1966, now Patent No. 3,484,232, dated Dec. 16, 1969. This application Sept. 23, 1969, Ser. No. 860,307

The portion of the term of this patent subsequent to Dec. 16, 1986, has been disclaimed.

Int. Cl. C21c *7/04*

U.S. Cl. 75—59 **3 Claims**

A halogenated compound is brought in liquid phase into contact with a porous device which on its opposite side contacts molten ferrous metal. The halogenated liquid is forced by gas pressure through the porous device and into the molten metal. The halogen may be used to remove unwanted elements from the metal. The nonhalogen part of the compound may combine with elements dissolved in the metal or may itself dissolve in the metal.

ERRATUM

For Class 75—101 see:
Patent No. 3,639,925

3,640,703

CYCLIC INTEGRATED COPPER PROCESS

James R. Cooper, Douglas, Ariz., assignor to Chemical Refiners, Inc.

Filed July 9, 1970, Ser. No. 53,561

Int. Cl. C22b *15/08*

U.S. Cl. 75—101 **3 Claims**

A cyclic integrated process for the production of copper metal is provided. In this process, copper ores or copper ore concentrates or, optionally, cement copper is converted to copper metal without the necessity for pyrometallurgical operations, thus entirely eliminating any air pollution problems. The source of copper values is taken into solution by leaching with a mineral acid such as sulfuric acid, converting the copper values to soluble copper salts. The pregnant liquor containing the soluble copper salts is treated with a precipitating gas such as hydrogen sulfide to precipitate the copper values as solid copper sulfide. The copper sulfide is dried and treated in a finely divided state with a reductant gas such as hydrogen, methane (either pure or contained in natural gas) or a reformed natural gas containing hydrogen and carbon monoxide. The byproduct gaseous hydrogen sulfide of the copper sulfide reduction step is recycled to precipitate more copper sulfide from the pregnant liquor. The mother liquor is treated to recover sulfuric acid which is optionally recycled to the pregnant liquor preparation step to dissolve more copper values.

3,640,704

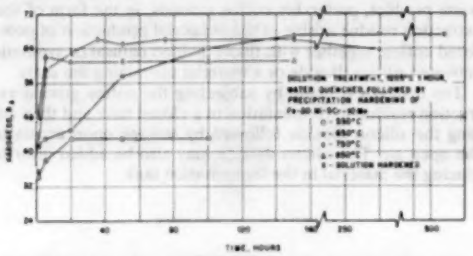
HIGH-TEMPERATURE-STRENGTH, PRECIPITATION-HARDENABLE, AUSTENITIC, IRON-BASE ALLOYS

Fred C. Robertshaw, Cincinnati; Jon L. Bartos, Loveland; James J. Hurst, Clarksville, and James August McGurty, Cincinnati, all of Ohio, assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 20, 1970, Ser. No. 4,374

Int. Cl. C22c *39/20*

U.S. Cl. 75—128 W **3 Claims**



This invention is for an iron-base alloy system characterized in that (a) it consists of an iron-nickel-chromium matrix which maintains substantially complete austenitic stability at temperatures from room temperature to the melting point; (b) it is susceptible to treatment to effect a precipitation-hardening resulting in a molybdenum-containing precipitated phase; (c) said alloy consists essentially of, in atom percent, 20 to 30 percent nickel, 5 to 10 percent chromium, a strength-inducing additive selected from either molybdenum or tungsten in an amount not exceeding 10 percent, and the balance iron.

3,640,705

TREATMENT OF PLATINUM GROUP METALS AND ALLOYS

Gordon Leslie Selman, and Peter James Ellison, both of London, England, assignors to Johnson, Matthey & Co. Limited, London, England

Continuation-in-part of application Ser. No. 520,361, Jan. 13, 1966, now abandoned. This application Jan. 30, 1969, Ser. No. 795,513

Claims priority, application Great Britain, Jan. 15, 1965, 1,882/65

Int. Cl. C22c *5/00*

U.S. Cl. 75—172 **10 Claims**

An alloy and method for making the same including alloying with platinum, rhodium, iridium and their mixtures, alone or alloyed with palladium a stable base metal capable of forming a refractory compound. The resulting alloy is heated in the presence of a molecular oxygen containing gas such as air or oxygen at a temperature ranging from 900° to at least 1,200° C. whereby the stable refractory compound is formed internally of said alloy and is dispersed uniformly therethrough.

3,640,706

METHOD FOR RECOVERING SUBSTANTIALLY PURE NICKEL FROM AMMONIACAL NICKEL AMMONIUM CARBONATE LEACH SOLUTIONS

Nicolas Zubryckyj, Praca Roamos de Azewedo 254, Sao Paulo, Brazil; Vladimir Nicolaus Mackiw, 9 Blair Athol Crescent, Islington, Ontario, and Donald Robert Weir, 10228 109th Street, Fort Saskatchewan, Alberta, both of Canada

Filed Feb. 20, 1970, Ser. No. 13,191

Int. Cl. C22b *23/04*

U.S. Cl. 75—103 **5 Claims**

Nickel is recovered in pure elemental form from ammoniacal nickel ammonium carbonate leach liquors containing

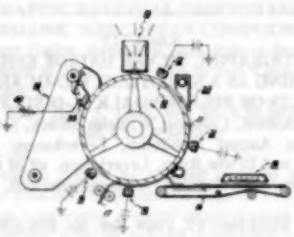
sulphur and other impurities including magnesium and silica. The liquor is first heated to precipitate nickel as impure basic nickel carbonate. The precipitate is redissolved in two stages in pure ammoniacal ammonium carbonate solution and undissolved solids, which contain the magnesium, silica and other impurities, are separated from the solution. The solution is then heated to reprecipitate nickel as basic nickel carbonate. Sulphur contaminants are converted to sulphate form by reacting the system, either before or after the reprecipitation step, with oxygen gas. The slurry from the reprecipitation step is then reacted directly with hydrogen at elevated temperature and pressure to produce pure nickel powder.

3,640,707

IMAGING SYSTEM

John P. Caldwell, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 11, 1969, Ser. No. 884,106
Int. Cl. G03g *13/14, 13/00*
U.S. Cl. 96—1.4 **1 Claim**



An improved method for removing residual toner images from an electrostatic recording surface adapted for continuous automatic operation comprising charging residual toner images supported on an electrostatic recording surface to a first polarity, then cascading a two-component developer material including carrier beads and toner particles in triboelectric relationship over the residual toner images and recording surface and concurrently biasing said residual toner images with a potential at a second polarity when commencing a pass through the development zone, whereby the residual toner images are released from said recording surface and intermixed with said developer material for development of said recording surface while in the development zone.

3,640,708

BARRIER LAYERS FOR ELECTROPHOTOGRAPHIC ELEMENTS CONTAINING A BLEND OF CELLULOSE NITRATE WITH A TETRAPOLYMER HAVING VINYLIDENE CHLORIDE AS THE MAJOR CONSTITUENT

Wesley D. Humphriss, Cupertino, Calif., and Lawrence C. Bartlett, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 9, 1970, Ser. No. 70,914
Int. Cl. G03g *5/02*; **C08f** *15/40*
U.S. Cl. 96—1.5 **14 Claims**

An electrophotographic element comprised of a support, an electrically conductive layer and an insulating photoconductive layer is provided with a barrier layer composed of a blend of cellulose nitrate with a tetrapolymer of methyl acrylate, acrylonitrile, acrylic acid and vinylidene chloride interposed between the electrically conductive layer and the insulating photoconductive layer. Barrier layers of this composition provide good adhesion to the contiguous layers, so as to permit flexing of the element without damage, as well as excellent electrophotographic properties.

3,640,709

ELECTROPHOTOGRAPHIC COPYING MATERIAL AND PROCESS OF PRODUCING THEREOF

Kishichiro Kondo; Hiroo Iwata, both of Aichi-ken; Narlo Yamaguchi; Sakae Shimizu, and Kazuo Tubuko, all of Tokyo, all of Japan, assignors to Kabushiki Kaisha Ricoh and Toa Gosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1968, Ser. No. 786,417
Claims priority, application Japan, Dec. 27, 1967, 42/83738
Int. Cl. G03g *5/00, 7/00*; **H01c** *13/00*
U.S. Cl. 96—1.5 **3 Claims**

An electrophotographic copying material comprising a support and a light-sensitive or photoconductive layer formed on one surface of said support and comprising a resinous binder. The photoconductive layer contains a photoconductive substance and is formed by dispersing said photoconductive substance in a water-emulsified resinous binder. The resinous binder is prepared by emulsion polymerization, in water, of at least one vinyl monomer in the presence of at least one acidic compound selected from the group consisting of an aliphatic carboxylic acid, an aromatic carboxylic acid, an acid anhydride of said carboxylic acids, an alicyclic compound having a carboxyl radical, a natural resin containing a resin acid and having a high electric resistance and a vinyl polymer having a carboxyl radical. The resultant photoconductive layer-forming solution is coated on said support and then the coated support is dried.

3,640,710

PHTHALOCYANINE PHOTOCONDUCTIVE ELEMENTS CONTAINING MULTIPLE BINDER MATERIALS

Joseph Mammino, and Robert M. Ferguson, both of Penfield, N.Y., assignors to Zerox Corporation, Rochester, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,718
Int. Cl. G03g *13/22, 5/06*
U.S. Cl. 96—1.5 **19 Claims**

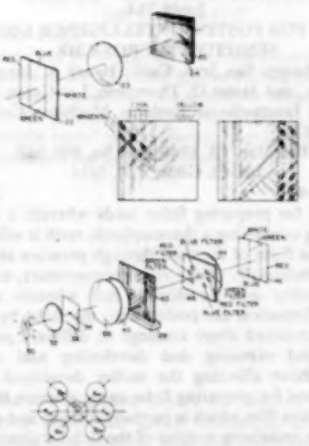
Improved electrophotographic elements comprising specific phthalocyanine pigments dispersed in specific binder materials in specific proportions are disclosed. Electrophotographic processes employing said elements are also disclosed.

3,640,711

DIFFRACTION PROCESS PHOTOGRAPHY AND RECONSTRUCTION: FIDELITY ENHANCEMENT BY MINIMIZATION OF CROSSTALK AND MOIRE PATTERNS

Edmund L. Bouche, Lexington, Mass., assignor to Technical Operations, Incorporated, Burlington, Mass.

Filed July 22, 1969, Ser. No. 843,312
Int. Cl. G03b *33/00*
U.S. Cl. 96—27 H **34 Claims**



This disclosure depicts methods and structures for multiplex information photorecording and retrieval with

minimization of interference between information channels. More particularly, this disclosure concerns diffraction process methods and structures for recording a plurality of images in superposition on a common recording medium each modulating an azimuthally distinct spatial carrier, and selectively retrieving the component images in a coherent projection system. Stress is placed upon predetermining the spatial frequency and azimuthal orientation of each of the carriers such that interchannel interference during projection is minimized.

3,640,712

HYDROPHILIC-HYDROPHOBIC PHOTON-SENSITIVE MEDIUM

Lester M. Field, Sherman Oaks; Richard A. Walker, and William E. McKee, both of Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 8, 1969, Ser. No. 882,951
Int. Cl. G03c *5/09, 1/00*
U.S. Cl. 96—27 **10 Claims**

A medium which is hydrophobic when unexposed, and hydrophilic when photon exposed is employed to produce discrete photon-developed areas. The medium comprises a solid dispersion in a film-forming binder of a photoconductive sensitive material such as zinc oxide, a sensitization enhancing material such as a copper salt and a hydrophobicity inducing agent such as a water repellent silicone, fluorocarbon material or a higher molecular weight organic acid such as stearic acid or linoleic acid. Exemplary processes of developing the photon exposed medium include application of aqueous liquids to form visible and/or transferable or relief images.

3,640,713

PHOTOGRAPHIC PROCESSES AND COMPOSITIONS THEREFOR

Sheldon A. Buckler, Lincoln, and Ronald F. Lambert, Cambridge, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 30, 1968, Ser. No. 772,017
Int. Cl. G03c *5/54*
U.S. Cl. 96—29 **11 Claims**

Tertiary organic phosphines containing a hydroxyl and/or an amino-substituted phenyl group are used as silver halide developing agents in photographic processing compositions which find particular utility in diffusion transfer photographic techniques.

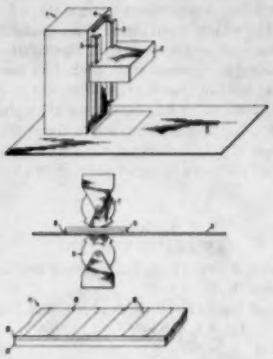
3,640,714

METHOD FOR POSTING INTELLIGENCE ON DIAZO SENSITIVE MICROFICHE

Robert B. Champ, San Jose, Calif.; Henry A. Jurgens, Boca Raton, Fla., and James O. Thompson, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 13, 1969, Ser. No. 806,965
Int. Cl. G03c *5/18, 5/34*
U.S. Cl. 96—49 **28 Claims**

A method for preparing fiche cards wherein a sensitized diazo coating containing a thermoplastic resin is adhered to a portion of the fiche of the card through pressure and at temperatures substantially above room temperature, exposed to actinic radiation and developed, and wherein additional pieces of information are posted onto the fiche by adhering additional sensitized diazo coatings to different portions of the fiche and exposing and developing said additional coatings without affecting the earlier developed coatings. Also, a method for preparing fiche cards wherein the fiche is a photosensitive film which is partially imaged and developed such that the remaining portion of the fiche is simultaneously desensitized and wherein additional pieces of information can be posted by adhering coatings of a photosensitive



material to portions of the desensitized film and thereafter imaging and developing.

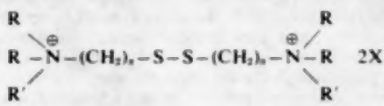
3,640,715

PHOTOGRAPHIC SILVER HALIDE EMULSION CONTAINING AS A SENSITIZER BIO-QUARTERNARY SALTS OF BIS-AMINOALKYL-DISULFIDES

Harald Huckstadt, Cologne; Wilhelm Salack, Schildgen/Berg. Gladbach; August Randolph, Leverkusen; Franz Moll, Cologne, and Erwin Ranz, Leverkusen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 17, 1969, Ser. No. 886,039
Claims priority, application Germany, Dec. 23, 1968, P 18 16 572.5
Int. Cl. G03c *7/00, 5/30, 1/28*
U.S. Cl. 96—55 **9 Claims**

The sensitivity of photographic silver halide emulsions can be increased and the fogging of those emulsions can be decreased by using bis-quaternary salts of bis-aminoalkyl-disulfides of the following formula:



wherein
R is alkyl, two R radicals at the same N may form together with the N a heterocyclic ring;
R′ is alkyl or aralkyl;
n is 1–6, and
X is any anion;
the compounds can be used as ripening agents or as additives to the casting solution or to the developer.

3,640,716

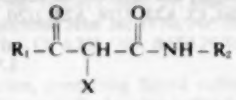
METHOD OF PREVENTING COLOR MIXING IN MULTILAYER-TYPE REVERSAL COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Tadashi Nagae; Yasushi Oishi, and Jun Hayashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 20, 1969, Ser. No. 826,283
Claims priority, application Japan, May 20, 1968, 43/33874
Int. Cl. G03c *7/00*
U.S. Cl. 96—56 **17 Claims**

The invention is directed to a method for preventing color mixing in multilayer-type color photographic light-sensitive materials developed by the coupler-in-developer process. The multilayer light-sensitive materials used herein comprise

a film base coated with a red-sensitive emulsion layer, a green-sensitive emulsion layer, and a blue-sensitive emulsion layer respectively. Cyan and magenta dye formation is prevented in the blue emulsion layer by addition thereto of a ballasted yellow coupler having the general formula



wherein R_1 represents a tertiary alkyl group, an unsubstituted cycloalkyl group, a substituted cycloalkyl group, an unsubstituted dicycloalkyl group, a substituted dicycloalkyl group, an unsubstituted aryl group or a substituted aryl group; R_2 represents an unsubstituted aryl group, a substituted aryl group, an unsubstituted heterocyclic group, or a substituted heterocyclic group; and X represents a hydrogen atom or a group capable of being split off during the coupling reaction.

3,640,717

PHOTOGRAPHIC REVERSAL PROCESS EMPLOYING ORGANIC MERCAPTAN COMPOUNDS

Jacques Henri Gallet, Arlington, and Robert Francis Gracia, Scituate, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed June 5, 1969, Ser. No. 830,867
Int. Cl. G03c *5/50*
U.S. Cl. 96—59 **47 Claims**

This disclosure relates to a rapid reversal photographic process. The process comprises the steps of (1) contacting a copy medium comprising a metal image pattern and a metal ion image pattern with an organic mercaptan compound to form insoluble metal mercaptide salts in the areas corresponding to the metal ion image pattern, and (2) contacting the copy medium with a photographic bleaching agent to oxidize the metallic image to soluble salts. The soluble salts may then be dissolved out or fixed by contacting with a suitable solvent or photographic fixing or stabilizing solution.

The process in a preferred embodiment comprises the steps of (1) exposing a photosensitive copy medium imagewise to a source of radiation to provide a negative latent image, (2) developing the copy medium to provide a negative metallic image in the exposed portions of the copy medium, (3) contacting the copy medium with an organic mercaptan compound to form insoluble metal mercaptide salts in the nonexposed areas of the copy medium, (4) contacting the copy medium with a photographic bleaching solution to reoxidize the metallic image in the exposed portions of the copy medium to soluble salts and (5) contacting the copy medium with a photographic fixing solution to dissolve the soluble salts from the exposed portions of the medium. The photosensitive medium may, for example, be a photographic silver halide emulsion or a photoconductor such as titanium dioxide dispersed in a binder.

3,640,718

SPECTRAL SENTIZATION OF PHOTOSENSITIVE COMPOSITIONS

George H. Smith, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 10, 1968, Ser. No. 720,377
Int. Cl. G03c *1/72*
U.S. Cl. 96—89 **9 Claims**

As a spectral sensitizer for photosensitive compositions containing a photolyzable organic halogen compound, at least one aromatic polycyclic compound having an ionization potential below about 7.4 is used. Preferred are colored, linear fused-ring polynuclear carbocyclic compounds (acenes) which are essentially unreactive with the organic halogen in the dark under room conditions.

3,640,719

SILVER HALIDE EMULSIONS CONTAINING BIS-HETEROCYCLIC N-CONTAINING COMPOUNDS AS ANTIFOGGANTS

Anita Von Konig, Leverkusen; Franz Moll, Koeln-Stammheim; Wolfgang Muller-Bardorff, Koeln, and Wilhelm Saleck, Schildgen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 22, 1969, Ser. No. 843,742
Claims priority, application Germany, Aug. 6, 1968, P 17 97 027.3
Int. Cl. G03c *1/34*
U.S. Cl. 96—109 **2 Claims**

The stability of photographic silver halide emulsions against the formation of fog is improved by the addition of bis-heterocyclic triazole, oxazole, thiazole, imidazole, thiadiazole or thiadiazolidine type compounds.

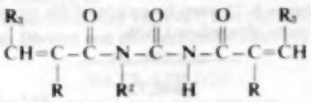
3,640,720

NONWANDERING HARDENING COMPOUNDS AND THEIR USE

Hyman L. Cohen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of application Ser. No. 682,530, Nov. 13, 1967. This application Aug. 27, 1970, Ser. No. 67,577
Int. Cl. G03c *1/30*
U.S. Cl. 96—111 **6 Claims**

Low molecular weight, nonwandering compounds for hardening natural and synthetic colloids without afterhardening. These comprise compounds having the structural formula:



wherein each R is hydrogen, an aliphatic or aromatic radical, and R^2 and each R_3 are hydrogen or lower alkyl.

3,640,721

GELATINOUS PHOTOGRAPHIC COATING COMPOSITION

Masao Ishihara; Osakazu Sugino; Yoshio Nishina; Isao Kohno, and Yuzuru Satoh, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1969, Ser. No. 851,447
Int. Cl. G03c *1/38*
U.S. Cl. 96—114.4 **4 Claims**

Light-sensitive photographic materials coated with a dried gelatin emulsion are stabilized against curling and decrease in flexibility under conditions of low relative humidity by incorporating in the gelatin emulsion prior to drying at least 2 percent by weight based on the amount of gelatin of a cyclohexane compound of the general formula

wherein the two A groups may be the same or different and are selected from the group consisting of —OH and $—CH_2OH$ and B is selected from the group consisting of H and $—CH_3$.

3,640,722

LIGHT-SENSITIVE POLYSULFONATES REACTION PRODUCT OF AROMATIC DISULFONYL CHLORIDE AND BISPHENOL CONTAINING STYRYL KETONE GROUP

Joseph A. Arcesi, and Frederick J. Rauner, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 22, 1969, Ser. No. 860,081
Int. Cl. C08g 17/13
U.S. Cl. 96—115 P 20 Claims

A light-sensitive polysulfonate contains units derived from an aromatic disulfonyl chloride, units derived from a light-sensitive bisphenol containing the styryl ketone group, and, optionally, units derived from a non-light-sensitive bisphenol. The polysulfonate is useful in preparing photomechanical images such as photoresists and lithographic plates.

3,640,723

ENZYMATIC TREATMENT OF SOYA MEAL

Helmut Uhlig, Rossdorf Bei Darmstadt, and Ekkehard Grampp, Ober-Ramstadt, both of Germany, assignors to Rohm Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed July 8, 1969, Ser. No. 840,065
Claims priority, application Germany, July 26, 1968, P 17 92 142.5
Int. Cl. A23l 1/20
U.S. Cl. 99—9 6 Claims

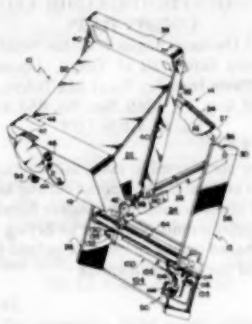
Soya meal is treated with a pectolytic enzyme alone or in combination with a cellulase or a cellulase and hemicellulase to give a soya product having a content of soluble reducible sugar increased to 10—25 percent by weight. An animal fodder combines 5–25 parts by weight of the treated product with 95–75 parts of powdered milk.

3,640,724

CAMERA FRAME MEMBER

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 13, 1969, Ser. No. 824,097
Int. Cl. C03b 17/04
U.S. Cl. 95—11 R 10 Claims



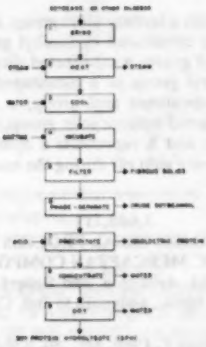
A compact folding camera including a plurality of housing sections, including at least a portion of one which provides for access to the interior of the housing, coupled together for movement between an extended, operative position and a folded, inoperative position. A support member, enclosed by the housing sections, is provided for locating a photosensitive element in position for exposure and for pivotally supporting a plurality of housing sections, a bellows, and an erecting system during movement of the housing sections, erecting system and bellows between the extended and folded position.

3,640,725

SOYBEAN FRACTIONATION EMPLOYING A PROTEASE

Samuel E. Sherba, Willingboro, N.J.; Ronald B. Steigerwalt, Levittown; William T. Faith, Jr., Warminster, both of Pa., and Carl V. Smythe, Moorestown, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed July 2, 1969, Ser. No. 838,534
Int. Cl. A23j 1/14; A23l 1/20
U.S. Cl. 99—17 13 Claims



Process of separating nutritional components from soybeans or other oilseeds, employing enzymatic hydrolysis of protein. Clean, whole soybeans are comminuted, heated at about 90°–140° C., and then cooled by adding more water. A proteolytic enzyme, preferably derived from an Aspergillus or Bacillus sp., is added to the slurry, which is then maintained at an incubation temperature of 25°–75° C. until the protein is sufficiently hydrolyzed. The fibrous solids portion is then removed from the slurry, being useful as a livestock feed supplement. The oil phase may then be removed from the fluid portion of the slurry, as by separating an aqueous phase from an oil-containing phase in a cream separator. The aqueous phase is then acidified to about pH 4.5, to precipitate isoelectric protein, which may be recovered, e.g., by centrifugation. To obtain the main product of this process, soy protein hydrolysate, the remaining aqueous phase is desirably concentrated by conventional evaporation techniques, adjusted to substantially neutral pH, and then dried, e.g., by spray drying or lyophilization. Alternatively, the aqueous phase containing protein and/or protein hydrolysate may be employed as the basis of a nutritious beverage.

3,640,726

FLAVOR ROBUSTA COFFEE

Gregory L. Bolt, Springfield Township, Hamilton County; Charles H. Brandt, Cincinnati; Aubrey R. McLain, Wyoming, and Jayantilal M. Patel, Reading, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of application Ser. No. 762,157, Sept. 24, 1968, now abandoned. This application Nov. 25, 1970, Ser. No. 92,880
Int. Cl. A23l 1/02
U.S. Cl. 99—68 10 Claims

Improved flavor Robusta coffee for use in a roast and ground coffee blend is produced by separately steam roasting, then postroasting Robusta coffee beans under particular conditions.

3,640,727
COFFEE BREWING PACKET
Merlyn R. Heusinkveld, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of application Ser. No. 849,169, Aug. 11, 1969, now abandoned, which is a continuation-in-part of application Ser. No. 763,411, Sept. 27, 1968, now abandoned. This application June 26, 1970, Ser. No. 50,365
Int. Cl. A23f 1/08; B65d 29/02
U.S. Cl. 99—77.1 12 Claims

A coffee packet, containing flaked coffee particles in a water-permeable pouch, for brewing coffee is disclosed.

3,640,728
INSTANT OAT CEREAL PRODUCT
Kenneth S. Ronai, Ridgewood, and Henry C. Spanier, Dumont, both of N.J., assignors to Nabisco, Inc., New York, N.Y.
Filed June 11, 1969, Ser. No. 832,486
Int. Cl. A23l 1/10
U.S. Cl. 99—80 R 10 Claims

An instant oat cereal product, requiring no cooking, comprising processed oats and a special oat fraction having a protein content greater than about 20 percent and a process for its preparation.

3,640,729
INSTANT OAT CEREAL PRODUCT
Kenneth S. Ronai, Ridgewood, and Henry C. Spanier, Dumont, both of N.J., assignors to Nabisco, Inc., New York, N.Y.
Filed May 8, 1969, Ser. No. 823,156
Int. Cl. A23l 1/10
U.S. Cl. 99—83 10 Claims

An instant oat cereal product, requiring no cooking comprising processed oats and an edible cereal hydrolysate texturizing agent with a Dextrose Equivalent or from about 6 to about 12 and a process for its preparation.

3,640,730
PROCESS FOR PREPARING DOUGH AND BATTERS, AND THE FLOUR AND FLOUR-BASED PRODUCTS
Jacques R. Rolland, Longueuil, Quebec, and John Holme, Preville, Quebec, both of Canada, assignors to The Ogilvie Flow Mills Company, Limited, Montreal, Quebec, Canada
Filed July 7, 1969, Ser. No. 839,475
Int. Cl. A21d 2/28, 2/22, 2/04
U.S. Cl. 99—91 25 Claims

The adverse effects of chlorine upon the bread making properties of flour are ameliorated by incorporating therein a definite, selected amount of a sulfhydryl-containing-or-producing reducing substance, preferably cysteine hydrochloride. The flours so obtained, at chlorine levels of between about 150 p.p.m. and about 900 p.p.m. and a reducing substance content of between about 20 p.p.m. and 100 p.p.m., provide improved all-purpose flours which give good results in the contrasting applications of bread and cake making. Further advantageous effects on the quality of the baked product can be obtained by including defined amounts of ascorbic acid type additives and/or oxidizing agents such as bromate or iodate salts.

3,640,731
SHELF STABLE EGG PRODUCTS
Milton Kaplow, White Plains, and Robert E. Klose, Bronx, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.
Filed Apr. 3, 1969, Ser. No. 813,279
Int. Cl. A23l 1/32
U.S. Cl. 99—113 3 Claims

Preparation of shelf stable egg products wherein dried egg whites, whole egg solids, or egg yolks are blended with 20 percent to 40 percent by product weight edible polyhydric alcohol to form a homogeneous mixture, combining the mixture with starch hydrolyzate solids and an antimycotic to form an emulsion containing about 9.7 percent to 35 percent starch hydrolyzate solids and about 14 percent to 32 percent moisture, and heat setting the emulsion.

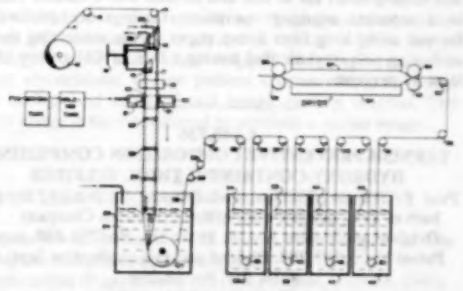
3,640,732
SIMULATED COOKED EGG
Ernest W. Johnson, Minnetonka, Minn., assignor to General Mills, Inc.
Filed Oct. 9, 1969, Ser. No. 865,180
Int. Cl. A23j 3/02
U.S. Cl. 99—114 13 Claims

The simulated egg approximates a boiled, poached or fried hen's egg. The simulated egg may be used together with other materials in a salad or eaten as is, for example, for breakfast. The simulated egg includes a white portion and a yolk portion. The white portion may be made from water, vegetable oil, a gel forming material such as low methoxyl pectin and a gel setting agent such as dicalcium phosphate. The yolk portion may be made from water, vegetable oil, protein, a gel forming material such as low methoxyl pectin, a gel setting agent such as dicalcium phosphate and coloring matter. The egg may be formed in the appropriate shape by molding.

3,640,733
EDIBLE SUBSTRATES COLORED WITH MONOAZO DYESTUFFS
Gustav E. Rast, Hamburg, and Russell I. Steiner, Williamsville, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.
Original application May 18, 1967, Ser. No. 639,264, now abandoned. Divided and this application Dec. 10, 1969, Ser. No. 880,516
Int. Cl. A23l 1/26
U.S. Cl. 99—148 10 Claims

Monoazo compounds of this invention, which may be termed 1-([2-alkoxy-5-alkyl-4-sulfophenyl]azo)-2-naphthol-6-sulfonic acids and physiologically acceptable salts thereof are used as dyestuffs for various substrates and especially for edible substrates, such as maraschino cherries.

3,640,734
PREPARATION OF FIBROUS REINFORCED CASING FROM ALKALI SOLUBLE POLYVINYL ALCOHOL COPOLYMERS
Seymour Oppenheimer, Chicago, and Albin F. Turbak, Danville, both of Ill., assignors to Tee-Pak, Inc., Chicago, Ill.
Filed Oct. 21, 1968, Ser. No. 769,026
Int. Cl. A22c 13/00
U.S. Cl. 99—176 14 Claims



A novel fibrous casing for packaging sausages and other meat and food products comprises a saturating tissue, preferably a long fiber hemp paper, coated or impregnated

with an insolubilized polyvinyl alcohol/polyvinyl ester copolymer. The casing is preferably prepared by coating or impregnating a saturating tissue with an aqueous alkaline solution of a polyvinyl alcohol/polyvinyl ester copolymer which is then insolubilized by treatment with acid and optionally by further treatment with a suitable cross-linking agent, viz formaldehyde, etc. The saturating tissue may be coated or impregnated with the polyvinyl alcohol copolymer solution and immediately formed into a tubular casing and the polyvinyl alcohol copolymer regenerated therein by acid treatment or may be coated or impregnated in sheet form, neutralized and dried and subsequently slit to size and formed into a tubular casing in a separate seaming operation. Casings are preferably formed using long fiber hemp paper as the saturating tissue and using polyvinyl alcohol copolymers having a D.S. of OH groups in the range from about 25–80 percent.

3,640,735

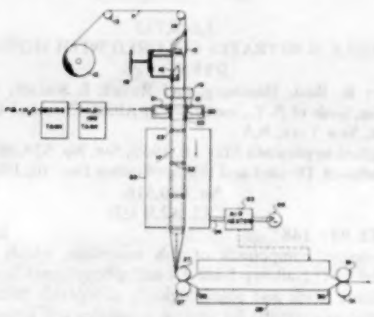
FIBROUS REINFORCED POLYVINYL ALCOHOL CASINGS

Seymour Oppenheimer, Chicago, and Albin F. Turbak, Danville, both of Ill., assignors to Tee-Pak, Inc., Chicago, Ill.

Filed Oct. 18, 1968, Ser. No. 768,625

Int. Cl. A22c *13/00*

U.S. Cl. 99—176 **13 Claims**



A novel fibrous casing for packaging sausages and other meat and food products comprises a saturating tissue, preferably a long fiber hemp paper, coated or impregnated with an insolublized polyvinyl alcohol. The casing is preferably prepared by coating and impregnating a saturating tissue with an aqueous solution of polyvinyl alcohol which is then insolublized, preferably by cross-linking with a suitable cross-linking agent, viz formaldehyde, etc. The saturating tissue may be coated and impregnated with the polyvinyl alcohol solution and immediately formed into a tubular casing or may be coated and impregnated in sheet form and dried and subsequently slit to size and formed into a tubular casing in a separate seaming operation. Casings are preferably formed using long fiber hemp paper as the saturating tissue and using polyvinyl alcohol having a D.S. of OH groups of at least 95 percent.

3,640,736

TARNISH-PREVENTIVE COMPOSITION COMPRISING HYDROXY-CONTAINING THIOL SULFIDES

Paul F. Warner, Phillips, and Edward E. Huxley, Borger, both of Tex., assignors to Phillips Petroleum Company

Original application Aug. 8, 1968, Ser. No. 751,060, now Patent No. 3,567,782. Divided and this application Sept. 1, 1970, Ser. No. 68,759

Int. Cl. C08h ; C09d ; C09q

U.S. Cl. 106—3 **2 Claims**

A tarnish-preventive composition for silver and copper surfaces comprising:

a. hydroxy-substituted mercapto sulfides having the formula

$$HS-R-S-CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-R',$$

b. an abrasive, and

c. the balance a diluent.

3,640,737

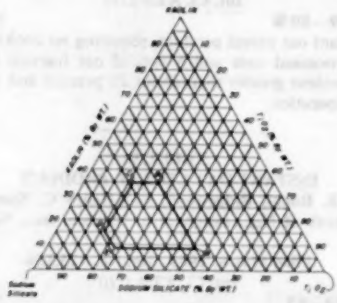
COMPOSITION FOR MARKING HOT METAL

David R. Lankard, Grandview Heights, and Herbert D. Sheets, Jr., Columbus, both of Ohio, assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 612,783, Jan. 31, 1967, now abandoned. This application July 9, 1969, Ser. No. 840,225

Int. Cl. C09d *11/00, 13/00, 1/02*

U.S. Cl. 106—19 **5 Claims**



A liquid composition for marking metal products while at high temperature, by jet-spray application, comprises a pigment of metal oxide, such as titanium dioxide, in a vehicle of sodium-silicate solution containing kaolin as a suspending agent.

3,640,738

BOROSILICATE GLASS COMPOSITION

John R. Detweiler, Jr., and Rao R. Tummala, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1970, Ser. No. 91,599

Int. Cl. C03c *3/04*

U.S. Cl. 106—54 **4 Claims**

A glass composition particularly adapted for use with ceramic materials in electronic module applications having a thermal coefficient of expansion substantially matching the thermal coefficient of expansion of ceramic material, and a low dielectric constant less than 4.5. The composition is a borosilicate glass consisting essentially of SiO_2, B_2O_3, CaO, Al_2O_3, Na_2O, K_2O, BaO, ZrO_2, and MgO in relatively precise amounts.

3,640,739

HIGH ALUMINA REFRACTORIES

Wate T. Bakker, Severna Park, Md., assignor to General Refractories Company, Philadelphia, Pa.

Filed May 29, 1969, Ser. No. 829,132

Int. Cl. C04b *35/10*

U.S. Cl. 106—65 **8 Claims**

Disclosed herein is a refractory brick batch mix which consists essentially of, by weight, about 85 to 96 percent alumina, about 3.99 to 13.99 percent silica, about 0.01 to 0.5 percent of a lithium compound capable of oxidizing to lithium oxide, and about 1 to 5 percent bentonite. Refractories

prepared from these mixtures exhibit increased strength, higher density, lower porosity and higher refractoriness compared to those previously available.

3,640,740
PROTEIN ADHESIVE COMPOSITIONS
John T. Stephan, Longview, and Alex James Golick, Seattle, both of Wash., assignors to Commerical Solvents Corporation, New York, N.Y.
Filed Apr. 10, 1969, Ser. No. 815,197
Int. Cl. C08h 7/00
U.S. Cl. 106—138 5 Claims

An adhesive composition having particular utility for the manufacture of laminated cellulosic products wherein one component is an aqueous alkali-dispersed protein and the other component is an oxazolidine, e.g. (5-hydroxymethyl-1-aza-3,7-dioxabicyclo[3,3,0]octane).

3,640,741
COMPOSITION CONTAINING GEL
Donald E. Etes, Crystal Lake, Ill., assignor to Hollister Incorporated
Filed Feb. 24, 1970, Ser. No. 13,608
Int. Cl. C08b 19/10, 21/30, 21/32
U.S. Cl. 106—170 14 Claims

A new plastic composition which is slow dissolving in aqueous media and can be used to slowly release medication or other additive ingredients in an aqueous environment, which plastic composition is prepared by cross-linking a hydrophilic colloid such as carboxymethyl cellulose gum or alginate gum with a cross-linking agent, usually a polyol such as propylene glycol, in a relatively nonreactive water soluble carrier such as glycerol. The total composition, including the carrier, sets up into a plastic gel, the consistency of which can be varied by varying proportions of ingredients. The reaction can be speeded or driven to a more completely cross-linked state by using a catalysts such as aluminum or calcium salts. Complexing agents can be included for complexing the catalysts and releasing it slowly throughout the reaction to slow the reaction down where desired. Generally, the reaction proceeds faster in a close to neutral or basic medium at pH's ranging up to 10 or 11 and slower in an acid medium at pH of 5 and below so the rate of reaction can be controlled by adjusting the pH. Usually the composition will contain medication or cosmetic additives or ingredients and it can be molded by extrusion or the like into any predetermined form, e.g., in the form of a ring. In a preferred form, the composition has excellent pressure sensitive adhesive properties and these properties are very pronounced where the hydrophilic colloid used is carboxymethyl cellulose.

3,640,742
PLASTICIZER BLEND FOR CELLULOSE ESTERS
George P. Touey, and Cephas H. Sloan, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed July 3, 1967, Ser. No. 650,658
Int. Cl. C08h 17/42
U.S. Cl. 106—179 6 Claims

A cellulose ester plasticizer blend made from about 40 to 60 percent by weight of glyceryl triacetate with the remainder being primarily a poly(ethylene glycol) diacetate.

3,640,743
TITANIUM DIOXIDE PIGMENT
Gerard Martin Sheehan, Lynchburg, Va., assignor to American Cyanamid Company, Stamford, Conn.
Continuation-in-part of application Ser. No. 636,628, May 8, 1967, now Patent No. 3,528,837. This application July 30, 1970, Ser. No. 59,672
Int. Cl. C09c 1/36
U.S. Cl. 106—300 3 Claims

This invention relates to titanium dioxide pigment of improved photochemical resistance which contain alumina and has a surface coating of a mixture of hydrous oxides of aluminum, silicon and zinc. The resulting pigment possesses improved resistance to discoloration and chalking upon exposure to ultraviolet light and is particularly useful as a pigmenting material for coating compositions and for opacifying resinous materials including laminates which are conventionally used in wall coverings, counter tops and cabinet facings.

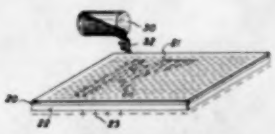
3,640,744
TITANIUM DIOXIDE OF IMPROVED CHALK RESISTANCE
Albert Dietz, New Martinsville, W. Va.; Neil C. Goodspeed, and Russell R. May, Jr., both of Wadsworth, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Feb. 28, 1969, Ser. No. 803,448
Int. Cl. C09c 3/02
U.S. Cl. 106—300 7 Claims

Pigmentary titanium dioxide, especially titanium dioxide containing coreacted aluminum and silicon, is heat treated and then given a hydrous metal oxide coating, e.g., an alumina and silica coating. The resulting pigment has good chalk resistance and good retention of optical properties, such as gloss, color and tint efficiency.

3,640,745
METHOD OF PREPARING PIGMENTARY TITANIUM DIOXIDE
Donald E. Darr, Wadsworth, Ohio; G. Byron Edwards, Moundsville, W. Va.; Clifford E. Loehr, Akron, and Elgin E. Young, Doylestown, both of Ohio, assignors to P.P.G. Industries, Inc., Pittsburgh, Pa.
Filed July 25, 1969, Ser. No. 844,970
Int. Cl. C09c 1/36
U.S. Cl. 106—300 21 Claims

Agglomerated pigmentary titanium dioxide is prepared by vapor phase oxidation of titanium halide in a reaction chamber at elevated temperatures in the presence of controlled amounts of alkali metal cation and auxiliary gas.

3,640,746
ADHESIVE CONTACT ELECTRIFICATION IMAGING
Werner E. L. Haas, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Sept. 18, 1968, Ser. No. 760,552
Int. Cl. G03g 13/22
U.S. Cl. 117—17.5 8 Claims



A method of imaging wherein an imaging member including an adhesive coating is placed in contact with an image bearing original and, when stripped therefrom, retains a latent electrostatic charge pattern corresponding to image and background areas of said image bearing original. The latent image is then developed to produce a visible image.

3,640,747
METHOD OF REDUCING SANDINESS IN VINYL COATINGS
Douglas Steven Richart, Berks County, Pa., assignor to The Polymer Corporation, Reading, Pa.
Continuation of application Ser. No. 528,366, July 18, 1966, now abandoned. This application Sept. 12, 1968, Ser. No. 759,507
Int. Cl. B44d 1/094, 1/46
U.S. Cl. 117—21 3 Claims

A method of reducing sandiness in a vinyl coating produced by a heat fusion coating process. A soluble organic

tin compound is included as a component of the vinyl coating composition.

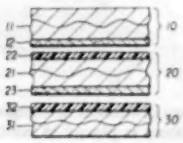
3,640,748
ANTIHALATION PHOTOGRAPHIC MEDIA AND METHOD OF PREPARATION
E. Scudder Mackey, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.
Continuation-in-part of application Ser. No. 835,890, June 12, 1969, now abandoned, which is a continuation of application Ser. No. 480,140, Aug. 16, 1965, now abandoned. This application Aug. 13, 1970, Ser. No. 63,627
Int. Cl. G03c *1/84*
U.S. Cl. 117—33.3 5 Claims

Preparation of antihalation layers by applying a gelatin coating containing a small amount of a manganous salt to a film base, and applying thereto an aqueous permanganate rinse containing an anionic surfactant which is nonreactive with the permanganate and is selected from the group consisting of the alkali metal salts of alkyl benzene sulfonic acids, and the alkali metal salts of polyfluoro- and perfluoroaliphatic surfactants, having a sulfonic or carboxylic acid group.

3,640,749
METHOD OF FIXING IMAGES CONSISTING OF DRY POWDERS ON PAPER
Rainer Lorenz, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 11, 1969, Ser. No. 806,271
Claims priority, application Germany, Mar. 14, 1968, P 16 71 644.2
Int. Cl. B44d *1/094*; G03g *13/20*; B44d *1/11*
U.S. Cl. 117—28 5 Claims

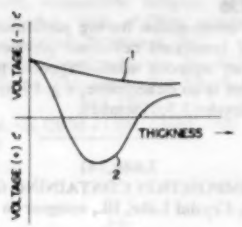
Dry powder images are fixed on paper by treating the powder image coated paper with an aqueous dispersion of a film forming synthetic resin.

3,640,750
TRANSFER COPY PROCESS AND MATERIAL
Walter Schutzner, Vienna, Austria, assignor to W. Koreska, Vienna, Austria
Filed Oct. 17, 1968, Ser. No. 768,346
Claims priority, application Australia, Nov. 13, 1967, A 10,191/67
Int. Cl. B41m *5/22*
U.S. Cl. 117—36.2 2 Claims



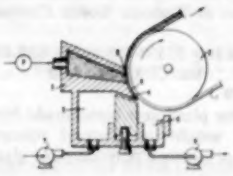
An upper sheet and a lower sheet are provided, adapted to be superimposed to form an interface between said sheets, and are coated on said interface with all ingredients required for a heat-induced, color-producing chemical reaction. The upper sheet has on a side adapted to form said interface a coating which contains at least one of said ingredients and which is locally transferable to said lower sheet under the action of writing pressure applied to said upper sheet. When the two sheets are superimposed to form said interface, writing pressure is applied to said upper sheet to transfer parts of said coating to said lower sheet, which is subsequently heated to induce said color-producing chemical reaction.

3,640,751
METHOD FOR LIQUID-DEVELOPING AN ELECTROSTATIC IMAGE
Kazuhiko Kasuya, Kawasaki-shi; Wasaburo Ohta, and Zenjiro Okuno, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Oct. 31, 1968, Ser. No. 772,242
Claims priority, application Japan, , 42170991
Int. Cl. G03g *13/10, 9/04*
U.S. Cl. 117—37 LE 14 Claims



An electrophotographic liquid-developing method comprising controlling the polarity of the toner by varying the mixing proportion of the dispersion media and/or the temperature of the developer solution. An electrostatic charge-substrate having an electrostatically charged latent image is immersed in the developer solution to convert such latent image into a visible image. Said developer solution comprises a toner consisting of pigment particles and at least one resin selected from the group consisting of alkyd resin, phenol resin and vinyl resin, and a carrier liquid in which said toner is dispersed. The carrier liquid comprises a mixture of two dispersion media having different affinities to said resin. Dispersion media having a larger affinity to the resin include halogenated hydrocarbons, aromatic hydrocarbons and petroleum hydrocarbons containing aromatic ingredients. Dispersion media having a smaller affinity to the resin include isoparaffinic and paraffinic hydrocarbons.

3,640,752
COATING METHOD
Mamoru Ishiwata, and Huruya Akio, both of Kanagawa, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Kanagawa, Japan
Original application May 2, 1967, Ser. No. 635,540, now Patent No. 3,503,370. Divided and this application June 24, 1969, Ser. No. 869,407
Int. Cl. B44d *1/02*
U.S. Cl. 117—47 2 Claims



In coating a coating composition on a web by a bridge of the coating composition between a coating applicator and the web, a gas blowing slot is formed at the side of the coating applicator into which the web enters to remove air or dust carried on the surface of the entering support and to provide a reduced pressure space at the back side of the bridge so that the bridge is maintained stable when the coating speed is increased.

3,640,753

MANUFACTURE OF POROMERIC MATERIALS

Carl Heinrich Krauch, Heidelberg, and Axel Sanner, Ludwigshafen, both of Germany, assignors to Badische Anilin & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Oct. 31, 1969, Ser. No. 873,117
Claims priority, application Germany, Nov. 2, 1968, P 18 06 652.9
Int. Cl. B44d *1/44*; D06n *3/04*
U.S. Cl. 117—62.2 9 Claims

The process of making poromeric materials which comprises impregnating webs of fibrous material with aqueous liquids containing olefinically unsaturated monomers which can be polymerized using redox catalysts, and, if desired, high polymeric plastics in dissolved, emulsified or dispersed form, freezing the webs of fibrous materials impregnated with the aqueous liquids, polymerizing the monomers using redox catalysts and thawing out and separating out the water and any residual monomer from the resulting poromeric materials. These poromeric materials are suitable as floor coverings, insulating materials, leather substitutes and coating materials.

3,640,754

GLAZING CONCRETE

Elisha Tauber, and Maxwell John Murray, both of Victoria, Australia, assignors to Commonwealth Scientific and Industrial Research Corporation, East Melbourne, Victoria, Australia

Filed Dec. 12, 1968, Ser. No. 783,350
Claims priority, application Australia, Dec. 12, 1967, 31060/67
Int. Cl. B44d *1/20*; C03c *5/00*
U.S. Cl. 117—70 B 12 Claims

This invention relates to a precess for glazing the surface of an article made of concrete. A glaze composition is applied to the surface and fired onto the surface at 550°–620° C. Glaze compositions of the invention comprise, proportionately,

A: – 1.4 to 2.6 moles SiO_2
B: – 0.1 to 0.2 mole TiO_2
C: – 0.4 to 0.9 mole PbO
0.1 to 0.6 mole Na_2O
0.0 to 0.2 mole Li_2O
0.0 to 0.3 mole ZnO

(the sum of amounts of PbO, Na_2O, Li_2O and ZnO, expressed in moles, is 1).

In a preferred aspect, after the concrete is fired it is recured to regain a substantial proportion of the strength lost in firing. Recuring is done by exposing to moisture such as by weathering, immersion in water to autoclaving.

3,640,755

COATINGS FOR AUTOMOTIVE EXHAUST GAS REACTORS

Walter J. Barth, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 13, 1969, Ser. No. 798,872
Int. Cl. C23c *7/00*
U.S. Cl. 117—71 M 7 Claims

Process for producing sheet metal substrates having high corrosion and erosion resistance to hot exhaust gases of internal combustion engines by

A. melt spraying a coating about 125–250 microns thick of a mixture of about 70–90 weight percent nickel and about 10–30 weight percent aluminum on sheet metal substrates of a chromium-iron alloy having, by weight, 10–40 percent chromium, 0–40 percent nickel, o–10 percent manganese, 0–6 percent aluminum and 35–80 percent iron, the chromium, nickel, manganese, aluminum and iron content totaling at least 95 percent, and

B. diffusion coating the nickel-aluminum coating with aluminum to a thickness of at least 25 microns; and

Exhaust manifold reactor inner chambers having at least the surfaces which deflect the initial exhaust gas impingement from internal combustion engines treated by the above coating process.

3,640,756

REMOISTENABLE PREGUMMED PRODUCTS

Pieter Johannes Adrianus Beersma, Haren (Gr.), and Albert Hendrik Veening, Sappemeer, both of Netherlands, assignors to Scholten Research N.V., Groningen, Netherlands

Filed Oct. 28, 1968, Ser. No. 771,307
Claims priority, application Great Britain, Oct. 31, 1967, 49,312/67
Int. Cl. C09j *7/04*; A61l *15/00*
U.S. Cl. 117—76 A 8 Claims

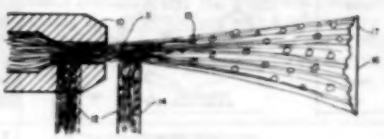
The object of the invention is a remoistenable product comprising a substrate, e.g. paper or paperboard, an adhesive consisting of a high molecular weight polymeric binding agent and a remoistenable amylaceous adhesive said product being characterized in that the amylaceous adhesive is a dry, cold water swelling, cross-linked, granular starch ester or starch ether containing hydrophilic substituents, the granules of said starch product being in discrete, nonagglomerated form.

3,640,757

FLAME DEPOSITED OXIDE COATING AND METHOD OF MAKING SAME

Donald C. Grubba, Westboro, Mass., assignor to Avco Corporation, Cincinnati, Ohio

Filed Aug. 9, 1968, Ser. No. 751,547
Int. Cl. B05b *7/22*
U.S. Cl. 117—93.1 PF 2 Claims



Very dense flame spraying deposited coatings containing an unusually high proportion of metal oxides are described and discussed. A preferred method for producing these coatings is described in detail. The coatings are produced by using usually corrosive oxidizing media in contact with the spray deposited particles.

3,640,758

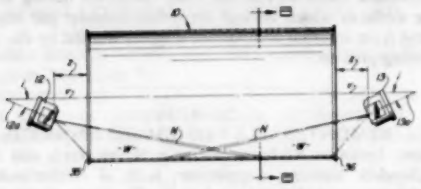
METHOD FOR COATING THE INTERIORS OF HOLLOW BODIES

Edwin F. Hogstrom, North Olmstead; William C. Stumphauzer, Sheffield Lake, and Eric T. Nord, Oberlin, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Mar. 5, 1970, Ser. No. 16,733
Int. Cl. B44d *1/08*; B05b *13/06*
U.S. Cl. 117—96 21 Claims

Method and means for coating the interior cylindrical surface of objects such as metal cans for food, beverages and other substances which need protection against injurious reaction with or pollution from contact with the material of the can. Airless spray coating of such surfaces revolving at

high speed by stationary spray nozzles external of the can. The nozzles project impinging airless sprays having desirable



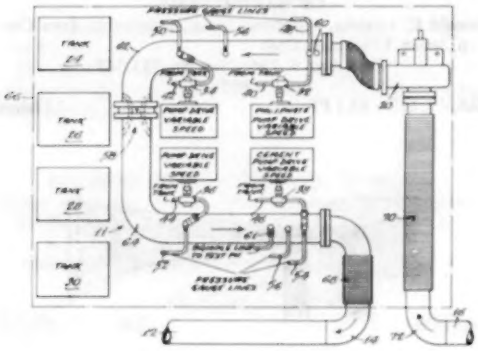
patterns through respective ends of open ended can cylinders into longitudinally elongated contact with the interior surface.

3,640,759

METHOD FOR LINING PIPES WITH CALCITE

Norman S. Primus, East Orange, N.J., and Raymond Hunhoff, Oak Lawn, Ill., assignors to National Water Main Cleaning Co.

Filed Apr. 29, 1969, Ser. No. 820,101
Int. Cl. B44d *1/02*; **B05b** *13/06*
U.S. Cl. 117—97 **3 Claims**



A device is provided for lining pipes and the like with calcite. The device includes a reaction and mixing chamber in a U-shaped tube through which a supersaturated solution of calcium carbonate is circulated and delivered through the pipe to be lined. The solution is recycled from the pipe through the reaction chamber where calcium chloride and sodium carbonate are added to maintain the supersaturated conditions. Portions of municipal water main systems can be closed off, lined quickly and put back in service.

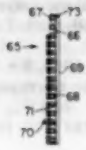
3,640,760

COATED SCREENS

George E. Nichols, Jr., Norfolk, Mass., assignor to Bird Machine Company, South Walpole, Mass.

Continuation-in-part of application Ser. No. 873,334, Nov. 3, 1969, now abandoned. This application Dec. 18, 1970, Ser. No. 99,535
Int. Cl. B44d *5/08*, *5/00*
U.S. Cl. 117—99 **4 Claims**

Hard-surfacing a screen with a detonation-deposited coating of bonded refractory particles adhered to the surface of the screen and to one another, the coating overlying substantially only the imperforate area of the screen surface, and



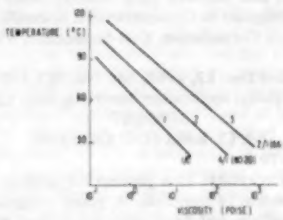
having a Vickers Hardness of at least 1,000 VPN (with a 300 gm. load) and a thickness at least on the order of 0.003 inch.

3,640,761

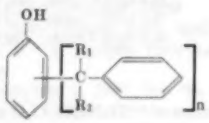
METHOD FOR ATTACHING ADDITIVE TO POLYAMIDE PELLETS

Yasushi Hamanaka; Hiromi Tajiri, both of Tsuruga; Kuniomi Etoh; Kaoru Furukawa, and Yukito Masai, all of Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan

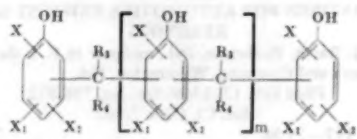
Filed Feb. 6, 1970, Ser. No. 9,175
Claims priority, application Japan, Feb. 6, 1969, 44/9150
Int. Cl. B44d *5/00*
U.S. Cl. 117—100 C **7 Claims**



A method for fixation of an additive on pellets of polyamides which comprises coating a phenol derivative of the formula:



wherein R_1 and R_2 are each hydrogen or alkyl having not more than four carbon atoms and n is an integer of 1 to 3 with or without a polyphenol derivative of the formula:



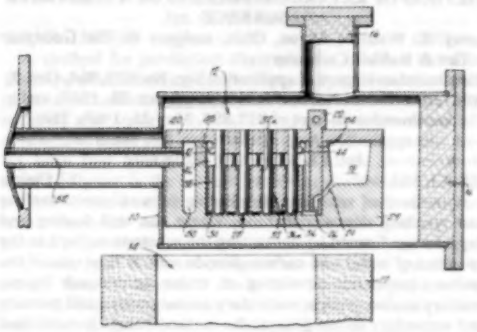
wherein X, X_1 and X_2 are each hydrogen, hydroxyl, alkyl having not more than 12 carbon atoms or alkoxy having not more than 12 carbon atoms, at least one of them being not hydrogen, R_3 and R_4 are each hydrogen, alkyl having not more than four carbon atoms or alkenyl having not more than four carbon atoms and m is an integer of 2 to 6 on the pellets and then attaching the additive thereto.

3,640,762

METHOD FOR VAPORIZING MOLTEN METAL

William A. Reed, West Richfield, and Frank J. Cole, Parma, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed May 26, 1970, Ser. No. 40,500
Int. Cl. C23c *13/00, 13/02, 11/00*
U.S. Cl. 117—107.1 10 Claims



Apparatus and method for vaporizing molten metal without entrainment of liquid droplets includes charging a pool of molten metal into a chamber in which there is a block having a plurality of passages. A finger is disposed in each passage of the block, a space being left between the inner surface of the passage and the outer surface of the finger to create a shell of fluid metal within the passage. Heating the shells of fluid metal generates metal vapor. The metal vapor is passed through a tortuous path and then directed by a nozzle toward a moving substrate to be coated.

3,640,763

METHOD OF PRODUCING NONBURNING PAPER

Edwin W. Lard, 12703 Beaverdale Lane, Bowie, Md.

Filed Aug. 12, 1969, Ser. No. 849,525
Int. Cl. C03c *25/02*; B44d *1/14*
U.S. Cl. 117—126 GF 5 Claims

A nonburning paper which is suitable for printing, writing, etc., is disclosed. The basic ingredients of the nonburning paper are: fiber glass, alkali metal silicates and halogenated elastomers. The method of producing this nonburning paper, which will extinguish itself in pure oxygen, is as follows: impregnating a sheet of fiber glass with a solution of an alkali metal silicate; evaporating the volatile solvent from the impregnated material; impregnating the treated fiber glass with a solution of a halogenated elastomer; and evaporating the volatile solvent from the impregnated material. The resultant sheet of paper is nonburning and, in those cases where its preparation is so tailored, it can be used as writing paper or can be used in conventional printing press, such as, offset lithographic printing press.

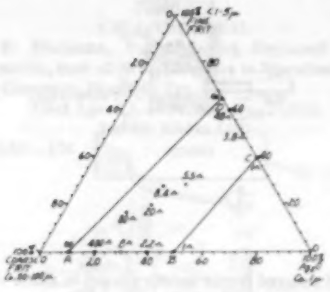
3,640,764

INTEGRAL HEATING ELEMENTS

Thomas S. Shevlin, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Sept. 26, 1968, Ser. No. 762,912
Int. Cl. B44d *1/18*
U.S. Cl. 117—212 10 Claims

Combinations are provided of organic binder, metallic particles, or powder converting to a metal under mild reducing conditions, and porcelain enamel frit, preferably in a range of sizes, at least a part of which has average particle diameters



which are at least 5 times the diameters of ultimate metal particles. These combinations are used to apply integral heating elements to various utensils.

3,640,765

SELECTIVE DEPOSITION OF METAL

Ralph David DiStefano, Mercerville, and Edward Anthony James, Skillman, both of N.J., assignors to RCA Corporation

Filed Aug. 6, 1969, Ser. No. 848,088
Int. Cl. G03c *5/00*
U.S. Cl. 117—212 4 Claims

Method of selectively electrolessly depositing a metal of the type that can be deposited on a catalyst-treated substrate, on exposed substrate areas, only, of an insulating substrate which also has areas covered with a synthetic resin-type photoresist, comprising successively treating the entire surface with a sensitizing solution and with an activating solution each of which contains a small amount of an octyl phenol ethylene ethanol containing five to 13 ethylene oxide groups, and then treating the entire surface with a solution for electrolessly depositing the metal, whereby the metal deposits only on the exposed substrate areas and not on the photoresist.

3,640,766

ELECTROPHOTOGRAPHIC-RECORDING MEMBER AND PROCESS OF PRODUCING THE SAME

Myron J. Jursich, Chicago, and Stanley F. Ciesla, Brookfield, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Jan. 7, 1970, Ser. No. 1,279
Int. Cl. G03g *5/02*; D21h *1/28*; B32h *27/10*
U.S. Cl. 117—218 12 Claims

Polyepihalohydrin is quaternized with a trialkyl amine to produce an electroconductive polymer. The quaternized polyepihalohydrin is applied to paper to produce a recording element having an electroconductive surface adapted for electrographic printing.

3,640,767

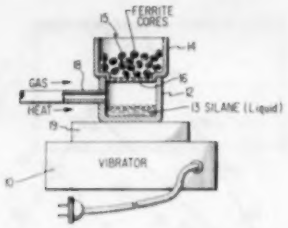
ENCAPSULATED MAGNETIC MEMORY ELEMENT

Thomas Philip Fulton, Brookline, and Henry Di Luca, Waltham, both of Mass., assignors to RCA Corporation

Filed May 16, 1969, Ser. No. 825,297
Int. Cl. H01f *1/22*
U.S. Cl. 117—234 2 Claims

Encapsulated ferrite magnetic memory cores are disclosed which have a very thin coating of polymerized gamma-aminopropyltriethoxysilane, whereby the cores are organophilic for adhesion to an uncured silicone rubber-coated substrate, are lubricated to minimize friction with wires passed

through the holes in the cores, and are hydrophobic to provide moisture-repellence of the cores in use in a memory. The cores are encapsulated by shaking a substantial bulk



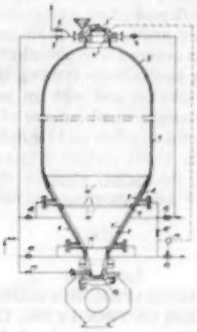
quantity of sintered ferrite memory cores in silane vapor at a temperature of about 220° C. in an inert gaseous environment having a known moisture content.

3,640,768

PROCESS FOR HYDROLYTIC DEGRADATION OF CELLULOSIC MATERIALS TO SUGARS

Rudolf Eickemeyer, Torwangerstr. 10, 8 Munich 8, Germany many

Filed Oct. 15, 1968, Ser. No. 767,669
Claims priority, application Germany, Oct. 17, 1967, P 15 67 335.5
Int. Cl. C13k *1/02, 1/04, 9/00*
U.S. Cl. 127—37 11 Claims



Cellulosic materials are chemically degraded in a percolator vessel by introducing a liquid agent from below into the cellulosic materials placed above the filter area of the vessel while the vessel is at about atmospheric pressure and introducing steam at a higher pressure than atmospheric from below the cellulosic material to raise the temperature in the vessel to at least 100° C., the displaced air being permitted to escape and then introducing steam at a pressure of about 1 atmosphere above atmospheric pressure from the top of the vessel to expel the liquid which is in excess of the absorptive power of the cellulosic material through the bottom of the vessel and then introducing further steam from the bottom of the vessel to bring up the temperature to the reaction temperature and recovering the reaction product.

The invention also embraces a vessel for practising the above process which is provided with a filter subdivided in at least two sections, one over the other, and provided with multilevel horizontal rows of perforations having a minimum diameter of 2–5 mm., increasing towards the periphery of the filter, and having a cross section of 0.2 to 4 percent of the cylindrical cross section of the percolator vessel, measured at the narrowest point of the conical holes, the rows of perforations preferably having a downwardly decreasing distance from each other.

ERRATUM

For Class 134—9 see:
Patent No. 3,640,293

3,640,769

METHOD OF RETARDING FOULING OF A SUBSTRATE SURFACE

Larry H. Watters, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company

Continuation-in-part of application Ser. No. 673,964, Oct. 9, 1967, now Patent No. 3,475,217, dated Oct. 28, 1969, and a continuation-in-part of 827,885, May 26, 1969. This application Aug. 1, 1969, Ser. No. 846,919
Int. Cl. B08b *3/00*; C23g *1/02*
U.S. Cl. 134—42 13 Claims

A method of retarding the fouling of a substrate surface and resulting deposits thereon, where the said fouling and deposits are formed by contacting the substrate surface in the presence of water and carbon dioxide with at least one of the amine compounds consisting of amine compounds having primary amino groups, secondary amino groups and primary and secondary amino groups, the method being characterized by treating the said surface and any resulting deposits thereon with at least one organic acid selected from aliphatic dicarboxylic acids having from two to 10 carbon atoms, tricarboxylic acids having six to 10 carbon atoms, alkanoic acids having from four to eight carbon atoms, unsaturated organic acids having three to eight carbon atoms and phenol. The method has particular utility in treating mold surfaces used for preparing polyurethane articles.

3,640,770

RECHARGEABLE METAL HALIDE BATTERY

Ralph Zito, Jr., Westford, Mass., assignor to The Zito Company, Inc., Derry, N.H.

Filed Oct. 20, 1969, Ser. No. 867,799
Int. Cl. H01m *35/00*
U.S. Cl. 136—6 30 Claims

A rechargeable metal halide battery, in which a salt of an electroplatable metal and a halogen selected from the class consisting of chlorine, bromine and iodine is electrolyzed from solution in a liquid medium during the charging cycle and reformed during the discharging cycle, the battery comprising at least one electrode comprising an electrically conductive corrodible element and a barrier layer along one side of the corrodible element, the barrier layer being substantially inert and impermeable to halogen in concentrations present in the battery, substantially impermeable to the liquid medium, and having a volume resistivity, ρ, such that ρd is not greater than about 0.1 ohm-in.^{2}, where d is the thickness of the barrier layer, the electrode having a total interface resistance, per square inch of electrolyte-contacting surface, not greater than about 0.05 ohms.

3,640,771

METAL BROMIDE BATTERY

Ralph Zito, Jr., Westford, Mass., assignor to The Zito Company, Inc., Derry, N.H.

Filed Oct. 20, 1969, Ser. No. 867,609
Int. Cl. H01m *35/00*
U.S. Cl. 136—6 4 Claims

A secondary battery comprising an anode, a cathode including a bromine-adsorbent layer capable of adsorbing at least half its weight of molecular bromine when the battery is charged, and an electrolyte comprising a divalent electroplatable metal bromide salt dissolved in an aqueous medium, the amount of said salt being such that, when the battery is in the charged state, the electrolyte comprises less than

about 0.0005 moles/ml. of dissolved metal bromide salt and less than about 0.02 gms/ml. of molecular bromine.

3,640,772
METHOD OF PRODUCING AN ELECTRODE FOR ALKALINE BATTERIES

Sven Uno Falk, and Lars-Goran Alfelt, both of Oskarshamn, Sweden, assignors to Svenska Ackumulator Aktiebolaget Jungner, Oskarshamn, Sweden

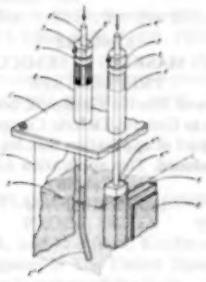
Filed June 3, 1969, Ser. No. 15,445
Claims priority, application Sweden, Aug. 21, 1968, 11265/68
Int. Cl. H01m 35/26
U.S. Cl. 136—67 10 Claims

A method for producing electrodes for alkaline batteries, the steps of which comprise pressing a dry pulverized mixture of an electrochemically active material, a conductive inert material and an organic bonding agent onto an electrically conductive base, said electrochemically active material having been first treated with a solution of an electrolyte-resistant polymer in the solvent, removing the solvent from the polymer-treated active material, grinding the polymer-treated active material into a suitable particle size, mixing said ground polymer-treated active material with an inert conductive material of the same composition in a larger quantity by weight than the aforesaid conductive material, and pressing the resulting mixture onto an electrically conductive base and into a continuous accumulator grid.

3,640,773
METHOD OF OPERATING FUEL CELL AND PREVENTING CORROSION

Robert J. Allen, Saugus, and Robert Lee Novack, Hanover, both of Mass., assignors to Prototech Company, Division of Bolt Beranek and Newman Inc., Cambridge, Mass.

Filed May 16, 1967, Ser. No. 638,937
Int. Cl. H01m 21/06, 27/22
U.S. Cl. 136—86 3 Claims



The present invention relates in an important aspect to the prevention of electrolyte creeping out of fuel and/or oxidant inlets and the like in closed fuel cell housings, through the use of high temperature substantially nonwetting plugs disposed at appropriate locations along the inlets.

3,640,774
METHOD OF INCREASING FUEL CELL CURRENT DENSITY

Walter Juda, Lexington; Robert J. Allen, Saugus, and Henry G. Petrow, Cambridge, all of Mass., assignors to Prototech Co., Division of Bolt Beranek and Newman Inc., Cambridge, Mass.

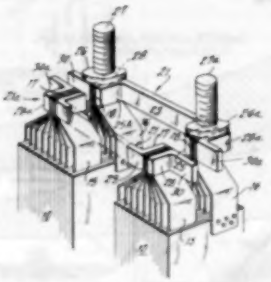
Filed Oct. 9, 1967, Ser. No. 673,951
Int. Cl. H01m 27/22
U.S. Cl. 136—86 4 Claims

The disclosure involves a method of increasing the current density (for a given voltage) in an electrochemical cell having a hydrogen-permeable anode layer, that comprises preactivating the layer before operating the same in the electrolytic medium while insuring sufficient cathode performance or activity during such operation.

3,640,775
CELL TERMINAL

Arthur E. Fitchman, Yonkers, and Raymond J. Nathe, Pleasantville, both of N.Y., assignors to Marathon Manufacturing Company, Houston, Tex.

Filed Apr. 13, 1970, Ser. No. 27,948
Int. Cl. H01m 5/00
U.S. Cl. 136—134 9 Claims



A battery core pole connector and brace for a pair of battery cores in which a comb connects like electrodes of each of the core. The connector is a U-shaped strap interconnecting like poles of two cores, rigidly bracing the cores with respect to each other. Each connector has extensions which brace the opposite sidewalls of the battery casing and space and secure the cores in place. The main run of each connector may also brace the adjacent wall on each side. The connector carries a terminal which may extend outside the casing. The connector resists rotative and other stresses which may be applied to the exterior terminals and prevents the transmission of such stresses to the cores.

3,640,776
COATED WIRE FOR USE IN PRESTRESSED CONCRETE STRUCTURES AND METHOD OF PRODUCING SAME

Eugene E. Haney, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed Sept. 10, 1969, Ser. No. 856,836
Int. Cl. C23f 7/26
U.S. Cl. 148—6.16 7 Claims

Wire for prestressed concrete structures. The wire is initially produced by cold reduction from a high-carbon material whereby to produce a high-strength wire having a tensile strength of about 250 K s.i. (1,725MN/m.^{2}). The surface of such wire may have a drawing compound embedded in it. This wire is first coated with a chromic acid, phosphoric acid solution which is then dried on the wire. A very thin organic coating, such as an organic phosphate, is then applied to the wire having the chromic acid, phosphoric acid coating dried thereon. The wire, now having the organic coating applied thereto, is then cured.

3,640,777
HEAT TREATMENT OF HIGH-CHROMIUM ALLOYS TO IMPROVE DUCTILITY

Brian Taylor, and Philip James Parry, Solihull, both of England, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Feb. 7, 1969, Ser. No. 797,679
Claims priority, application Great Britain, Feb. 18, 1968, 6,290/68
Int. Cl. C22f 1/10, 1/11
U.S. Cl. 148—13 6 Claims

Tensile ductility of high chromium-nickel (e.g., 50 percent chromium) and chromium-nickel-iron alloys improved when

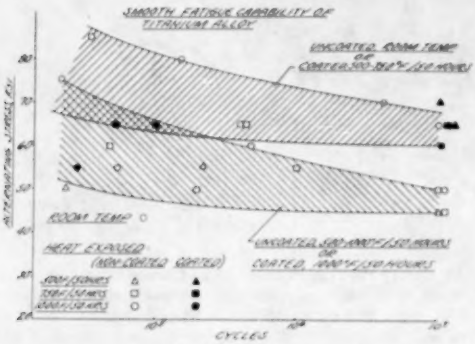
the alloys are subjected to an annealing treatment at a temperature of from about 600° C. to about 1,000° C. Incorporation of zirconium is quite beneficial in improving ductility, particularly at high chromium levels.

3,640,778

COATING OF TITANIUM ALLOYS

Jules P. Winfree, Jupiter, Fla.; Herbert E. Todd, West Hartford, Conn., and Charles C. McComas, Palm Beach Gardens, Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 27, 1969, Ser. No. 811,071
Int. Cl. C23f 7/00
U.S. Cl. 148—6 **7 Claims**



Titanium and its alloys are provided with a chemically bonded coating derived from a reaction at high temperature of certain aluminum-pigmented silicone resins with the titanium substrate to form in situ by decomposition a quasi-organic complex coating which not only provides improved oxidation and corrosion resistance together with improved physical properties associated with surface-oriented characteristics, such as fatigue and creep stability, but which extends the useful operating range of a number of these alloys to temperatures of 650°-900° F. or higher.

3,640,779

HIGH-CONDUCTIVITY COPPER ALLOYS

Elmars Ence, Hamden, Conn., assignor to Olin Corporation

Continuation-in-part of application Ser. No. 729,502, May 16, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 581,714, Sept. 26, 1966, now abandoned. This application Sept. 30, 1969, Ser. No. 862,529
Int. Cl. C22c 9/06
U.S. Cl. 148—32.5 **10 Claims**

New and improved copper base alloys combining high conductivity with good strength, with the composition consisting essentially of from 0.5 to 4.0 percent iron, from 0.2 to 2.5 percent cobalt, a material selected from the group consisting of phosphorus from 0.01 to 0.5 percent, boron from 0.001 to 0.25 percent and mixtures thereof, and the balance essentially copper, said alloy being characterized by the copper matrix having a fine, uniform dispersion of said iron, cobalt, phosphorus and boron precipitated throughout as complex intermetallic compounds.

3,640,780

METHOD OF PRODUCING ELECTRICAL SHEET STEEL WITH CUBE TEXTURE

Edward B. Stanley, Washington Township, Westmoreland County, Pa., assignor to United States Steel Corporation

Filed June 25, 1970, Ser. No. 49,977
Int. Cl. H01f 1/16
U.S. Cl. 148—111 **3 Claims**

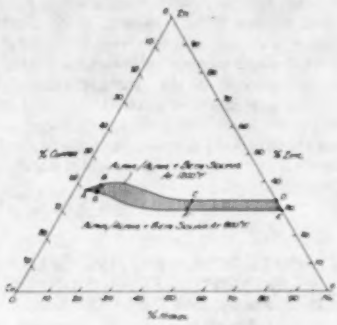
A method for producing double-oriented silicon-iron electrical sheet steel whereby conventional cube-on-edge oriented sheet steel is cross-rolled to about 0.010 inch with at least a 15 percent cold reduction and thereafter annealing the cross-rolled sheet at a temperature within the range 1,950° to 2,250° F. in a hydrogen containing atmosphere having a dew point of −30° F. or less for at least about 5 hours, or for a time sufficient to develop the cube texture.

3,640,781

TWO-PHASE NICKEL-ZINC ALLOY

Frank Joseph Ansuini, 176 Wayne Ave., Suffern, N.Y.; Jacob Schramm, 156 Edgecomb Road, Calhoun Lakes, Spartenburg, S.C., and Frank Arthur Badia, 41 Kingsley Road, Ringwood, N.J.

Filed Oct. 14, 1969, Ser. No. 13,913
Int. Cl. C22f 1/08
This application filed under Rule 47.
U.S. Cl. 148—12.7 **8 Claims**



Process of heat treating and mechanically working nickel-zinc alloys or copper-nickel-zinc alloys produces products having special alpha-beta microstructure characterized by high strength at room temperature and high deformability at elevated temperatures.

3,640,782

DIFFUSION MASKING IN SEMICONDUCTOR PREPARATION

Dale M. Brown, and Marvin Garfinkel, both of Schenectady, N.Y., assignors to General Electric Company

Continuation-in-part of application Ser. No. 675,227, Oct. 13, 1967, now abandoned. This application Aug. 16, 1968, Ser. No. 761,389
Int. Cl. H01l 7/44
U.S. Cl. 148—187 **9 Claims**

Discloses, in the fabrication of semiconductor devices, the use of a nonreactive metallic layer such as molybdenum, which forms an adherent bond with dielectric insulating

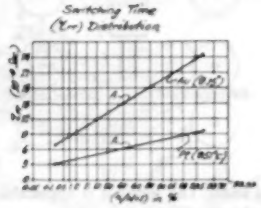
films, as a diffusion mask. The metallic layer may also be used as an etching mask to permit selective removal of portions of passivation layers.

3,640,783

SEMICONDUCTOR DEVICES WITH DIFFUSED PLATINUM

Robert F. Bailey, Los Alamitos, Calif., assignor to TRW Semiconductors Inc., Lawndale, Calif.

Filed Aug. 11, 1969, Ser. No. 848,928
Int. Cl. H01l *7/34*
U.S. Cl. 148—186 **4 Claims**



A semiconductor device having platinum dispersed throughout said device. The dispersion of platinum within a semiconductor device results in improved electrical characteristics of the device. In a silicon diode, the improved characteristics include the reduction of reverse recovery time and an increase in the breakdown voltage. In a silicon transistor, the improved characteristics include the achievement of high switching speeds while maintaining high forward current gain.

3,640,784

BLASTING AGENTS CONTAINING GUAR GUM

Joseph J. Yancik, Creve Coeur; Roy E. Schulze, and Paul H. Rydlund, both of St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 5, 1969, Ser. No. 804,682
Int. Cl. C06b *1/04, 11/00, 19/04*
U.S. Cl. 149—43 **3 Claims**

Granular water-resistant blasting compositions containing a water-soluble inorganic oxidizing agent, fuels, densifiers and guar gum.

3,640,785

CASTABLE FLUOROCARBON BINDERS FOR PROPELLANTS

John D. O'Drobinak, and Martin H. Kaufman, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 28, 1964, Ser. No. 394,379
Int. Cl. C06b *3/00*
U.S. Cl. 149—88 **19 Claims**

1. A castable binder composition comprising the following constituents:

a fluorocarbon monomer selected from the group consisting of 1H, 1H, 9H-hexadecafluoro-1-monomethacrylate, 1H, 1H, 9H-heradecafluoro-1-nonanoacrylate, 1H, 1H, 7H-dodecafluoro-1-heptanoacrylate, 1H, 1H, 5H-octafluoro-1-pentanoacrylate and mixtures thereof;

a plasticizer selected from the group consisting of triethylene glycol dinitrate, pentaerythritol trinitrate, trimethylol ethane trinitrate, diethylene glycol dinitrate, butanediol dinitrate, a copolymer of vinylidene fluoride and perfluoropropylene, bis(2-fluoro-2,2-dinitroethyl) formal and mixtures thereof;

a cross-linking agent selected from the group consisting of triallycyanurate and divinyl benzene; and

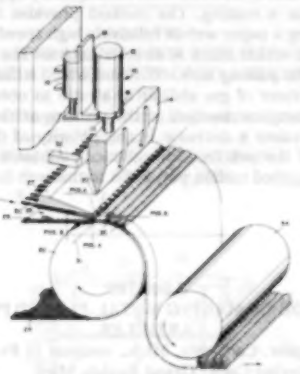
a catalyst selected from the group consisting of azobisisobutyronitrile, benzoyl peroxide, dichlorobenzoyl peroxide and methylethylketone peroxide.

3,640,786

PILE FABRIC AND METHOD OF MAKING THE SAME

Charles W. Carpenter, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of application Ser. No. 731,221, May 22, 1968, now abandoned. This application Nov. 29, 1968, Ser. No. 780,038
Int. Cl. B32b *5/08*
U.S. Cl. 156—73 **7 Claims**



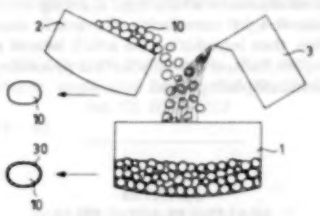
This invention relates to a method of making pile fabrics wherein thermoplastic pole yarn is fusion-bonded to a thermoplastic backing by means of sonic energy, thereby effecting localized heating of the pile yarn and backing at the points of contact without loss of orientation in either the pile yarn or the backing, if an oriented backing is used, between the bond points.

3,640,787

METHOD OF PRODUCING SHAPED BODIES OF LOW SPECIFIC GRAVITY

Rudolf Heller, Mattackerstrasse 43, Zurich, Switzerland

Filed Mar. 17, 1967, Ser. No. 623,882
Claims priority, application Switzerland, Mar. 23, 1966, 4201/66; July 1, 1966, 9601/66
Int. Cl. F16l *59/00*; **C04b** *43/00*; **B32b** *19/00*
U.S. Cl. 156—77 **19 Claims**



Bodies of low specific gravity produced by coating a mass of roundish hollow granules, such as expanded or swelled polystyrene granules, with a hardenable liquid binder material, mixing the mass of thus coated granules with a pulverulent solid material so as to adhere particles of the solid material to the coating, and hardening the hardenable binder coating, and shaped cellular structures formed by compressing the mass of hardenable binder coated hollow granules having pulverulent material adhering to the coating during or prior to the hardening of the hardenable liquid binder material.

3,640,788

METHOD OF MAKING POLYOLEFIN-PAPER LAMINATE WITH FLAME TREATMENT OF THE PAPER

John Harold Flynn, 234 Elk Ave., New Rochelle, N.Y.

Continuation-in-part of application Ser. No. 643,147, June 2, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 325,055, Nov. 20, 1963, now abandoned. This application Dec. 29, 1969, Ser. No. 888,954

Int. Cl. B29c *25/00*

U.S. Cl. 156—82 **3 Claims**

The disclosure relates to a method of priming paper web for its firm and even bond with subsequently applied molten polyolefin as a coating. The method provides for continuously feeding a paper web at relatively high speed to and past a station at which there is directed against the face to-be-coated of the passing web stiff flame which is fed by a combustible mixture of gas and air at a ratio to obtain substantially complete combustion of the mixture at the flame tip, thereby to cause a decrease in the polarity of the cellulose structure of the web face for enhanced adhesion of the subsequently applied molten polyolefin to this web face.

3,640,789

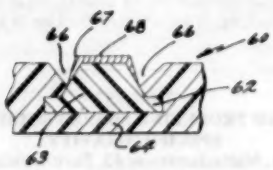
METHOD OF MAKING METAL-PLATED PLASTIC ARTICLES

Ivan C. Hepfer, Caledonia, Mich., assignor to Furniture City Manufacturing Corp., Grand Rapids, Mich.

Filed Apr. 1, 1969, Ser. No. 811,706

Int. Cl. C23b *5/02*

U.S. Cl. 156—92 **9 Claims**



A platable plastic component and a nonplatable plastic component are joined together into a multicomponent article. The entire multicomponent article is then processed in an operation for plating plastics having the steps of introducing the multicomponent article into a strong oxidizing acid solution, followed by introducing the article into a noble metal solution, then introducing the article into an electroless nickel or copper bath, and finally further processing the article in conventional plating baths.

3,640,790

SEALING PLASTIC FILM

Edward Kenneth Rowley, Beloeil Station, Quebec, and Clayton Thomas Waugh, Montreal, Quebec, both of Canada, assignors to Canadian Industries Limited, Montreal, Quebec, Canada

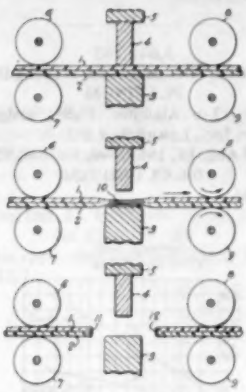
Filed Apr. 23, 1970, Ser. No. 31,229

Claims priority, application Canada, May 21, 1969, 052,161

Int. Cl. B32b *31/18*

U.S. Cl. 156—251 **4 Claims**

A method of heat sealing layers of plastic film wherein the film layers are heated in contact until the plastic attains a flowable state, and the area of flowable plastic is then extended until the plastic separates. The molten plastic then retracts towards the unheated flank of the seal area to form matching bead seals. The method is applicable to automatic bagmaking machines.



3,640,791

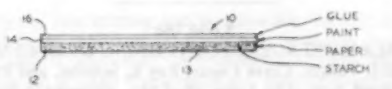
PROCESS OF PREPARING AND APPLYING AN IMPROVED PAINTING DEVICE

Richard Rosenheim, 7637 Yates Blvd., Chicago, Ill.

Filed Feb. 19, 1969, Ser. No. 800,487

Int. Cl. B44c *1/10;* **B44d** *1/12*

U.S. Cl. 156—230 **4 Claims**



Painting devices and processes especially suitable for patching painted surfaces. The device comprises a releasable paint-coated paper, amenable to gluing onto surfaces requiring the patch.

3,640,792

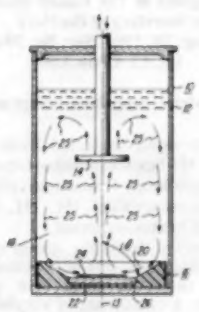
APPARATUS FOR CHEMICALLY ETCHING SURFACES

Raymond Arthur Alleman, and William Nelson Henry, both of Lancaster, Pa., assignors to RCA Corporation

Filed Aug. 7, 1970, Ser. No. 61,976

Int. Cl. C23g *3/00;* **H01l** *7/50*

U.S. Cl. 156—345 **4 Claims**



An apparatus for chemically etching a substantially flat surface of a workpiece such as a semiconductor wafer comprises a vessel containing a fluid etchant, means for producing a toroidal turbulence in the etchant, and a substantially

circular, inverted, conical deflecting surface around the workpiece for deflecting falling fluid from the peripheral region of the toroidal turbulence toward the workpiece surface. The central axes of the toroidal turbulence, and the deflecting surface coincide.

3,640,793

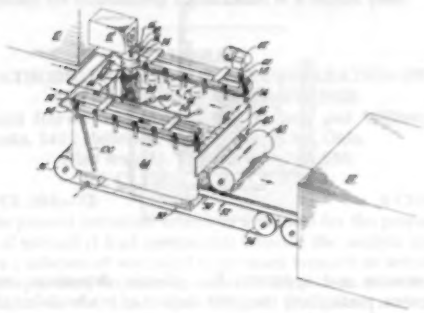
SELF-CLEANING HOOD STRUCTURE

James W. Scott, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation

Filed Feb. 9, 1970, Ser. No. 9,761

Int. Cl. B29j *5/02*

U.S. Cl. 425—83 **17 Claims**



A forming hood having an endless belt as a sidewall thereof. The endless belt is supported from a trolley at the top, so that it is free to oscillate laterally, and preferably includes at least one head or tail pulley having longitudinal projections which flex the belt as it traverses the pulley. The endless belt preferably has a critical surface tension of wetting that is less than the surface tension of the binder used in the forming hood, and may also include a seal between the bottom edge of the belt and the forming conveyor on which the pack is made. The seal preferably includes passage means for communicating reduced pressure to the back side of the belt to keep the edge adjacent the forming conveyor from moving laterally.

3,640,794

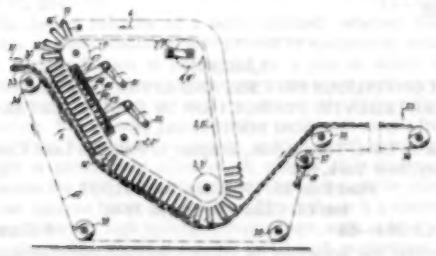
APPARATUS FOR FORMING HEAT-SEALED END SEAMS IN TUBE SECTIONS OF PLASTICS MATERIAL

Kurt Rochla, Lengerich, Westphalia, Germany, assignor to Windmoller & Holscher, Westphalia, Germany

Original application June 15, 1967, Ser. No. 646,384, now Patent No. 3,544,407. Divided and this application Oct. 21, 1969, Ser. No. 871,212

Int. Cl. B32b *31/20*; **B30b** *15/34*; **B29c** *27/02*

U.S. Cl. 156—583 **7 Claims**



The open end of each tube section is continuously moved by retaining tools past a stationary source of radiant heat. The fused bead is then consolidated by the application of pressure. In this process, those end portions where the tube sections are to be closed by heat sealing are arranged one behind the other in planes which are at right angles to the direction of movement of said ends past the source of radiant heat. The tube sections are held in such a manner by the platelike holding tools that said end portions protrude from the holding tools toward the source of radiant heat. The tube sections are subsequently pulled to move the fused bead between the holding plates, which are slightly spaced apart. The holding plates are then pressed against the heat-sealed seams to consolidate the same.

3,640,795

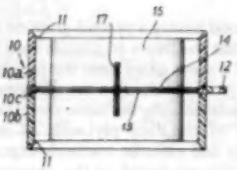
A DECORATIVE ARTICLE FOR REFLECTING LIGHT FROM A METALLIZED STRIP ONTO A FLUORESCENT MATERIAL

Robert Stuart Burgess, Farnham, England, assignor to Panaura Limited, London, England

Filed July 1, 1968, Ser. No. 741,365

Int. Cl. B44f *1/00*, *7/00*

U.S. Cl. 161—3 **7 Claims**



An article of decoration comprises a member having a surface which is preferably coated with a fluorescent material, and metallized strip material secured in front of the surface so that at least part of the strip material is disposed edge-on to the surface whereby light, whether sunlight or point source artificial light, is reflected from the metallized strip material and projected on to the fluorescent material which acts as a screen thereby intensifying the fluorescence in various patterns according to the focus and/or angle of incidence of the light, the fluorescence being reflected to the observer in the metallized strip material. The strip material is preferably colored on one side, the color being different from that of the fluorescent coating, and preferably extends in a regular curved pattern over said surface. The member and strip material may be disposed in a colored transparent or opaque or metallized casing.

3,640,796

A DECORATIVE BUILDING ELEMENT

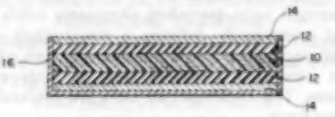
Marie-Josephe Cotelle, 73 rue Victor Hugo Puteaux, Haute-de-Seine, France

Filed Oct. 17, 1969, Ser. No. 867,407

Claims priority, application France, Oct. 18, 1968, 170438

Int. Cl. B37b *5/18*

U.S. Cl. 161—43 **5 Claims**



A decorative building element comprised of at least one support layer of a foamed, cellular plastic material and a colored layer of an elastomeric organosilic material which adheres to the cellular material. The method comprises forming a paste of a self-vulcanizable material, mixing a color additive into the paste to disperse color into the paste, spread-

ing the paste into a thin layer on a cellular foam plastic material to which the paste can adhere and vulcanizing the paste to form a decorative building element.

3,640,797

FACING PLYWOOD HAVING PRINTED GRAIN

Youichi Taguchi, Nagoya, and Shinji Asano, Tsushima, both of Japan, assignors to Toyo Plywood Co., Ltd., Nagoya, Japan

Filed Oct. 20, 1970, Ser. No. 82,293
Claims priority, application Japan, Feb. 10, 1970, 45/11904
Int. Cl. B32b *5/12, 21/10*
U.S. Cl. 161—60 1 Claim

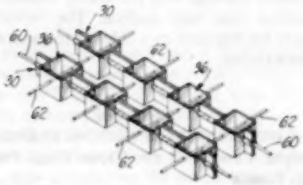
A facing plywood having a printed grain on the surface and so constructed that the fibers of a lauan face veneer and numerous fibers of a sheet glued onto the face ply and also the fibers of a grain patten printed on the surface of the sheet are all arranged in substantially the same direction, whereby the natural contour of the face ply with all its tiny grooves formed of vessels and vascular tracheids exposed on the surface can be finely reproduced on the uppermost surface for enhanced ornamental wood-graining effect.

3,640,798

COMPOSITE STRUCTURAL CORE ASSEMBLY

Douglas Deeds, 1706 West Arbor Drive, San Diego, Calif.

Filed Apr. 16, 1969, Ser. No. 816,524
Int. Cl. B32b *3/24, 3/18, 3/12*
U.S. Cl. 161—68 8 Claims



A curved laminated structure comprising a series of generally longitudinally extending stringers are assembled generally transversely adjacent, each stringer being composed of upright webs extending alternately solely longitudinally and transversely defining a longitudinal series of stringer web enclosures opening at opposite web edges. The webs have elongated members such as rods extending through them. The enclosures or cells are preferably filled with polymer foam.

ERRATA

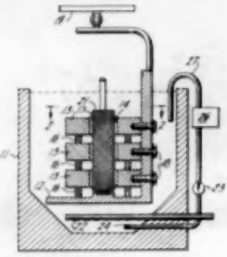
For Classes 161—159 thru 204—28 see:
Patent Nos. 3,640,829 thru 3,640,854

3,640,799

PROCESS FOR PRODUCING A WEAR-RESISTANT SURFACE ON A WORKPIECE

Gerhard Stephan, Heilbronn/N.; Heinz Harst, Neckarsulm; Gunter Laux, Heilbronn/N., and Alfred Kappes, Neckarsulm, all of Germany, assignors to NSU Motorenwerke Aktiengesellschaft, Neckarsulm and Wankel GmbH, Lindau Bodensee, Germany

Original application Sept. 6, 1968, Ser. No. 758,017, now Patent No. 3,514,389. Divided and this application Sept. 30, 1969, Ser. No. 871,038
Int. Cl. C23f *17/00*; C23b *13/00, 5/50*
U.S. Cl. 204—38 B 5 Claims



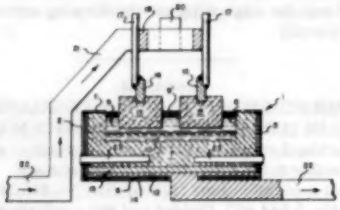
A process and apparatus for galvanic deposition on a workpiece, particularly the inner surface of trochoidal engine housings, of a metal matrix containing dispersed particles, for the purpose of improving wear resistance of highly stressed surfaces.

3,640,800

ELECTROLYTIC CELL

Arthur F. Johnson, 203 Creole Lane, Franklin Lakes, N.J.

Filed July 14, 1970, Ser. No. 54,829
Int. Cl. C22d *3/12, 3/02*
U.S. Cl. 204—67 29 Claims



An improved electrolytic cell having collector elements arranged horizontally in the cell and extending to the sides thereof, and a slab of aluminum disposed horizontally at the bottom of the cell to which the collector elements are connected.

3,640,801

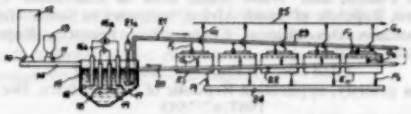
CONTINUOUS PROCESS AND APPARATUS FOR ELECTROLYTIC PRODUCTION OF SODIUM METAL FROM SODIUM SALTS

Frank E. Love, Tulsa, Okla., assignor to National Lead Company, New York, N.Y.

Filed Feb. 25, 1969, Ser. No. 801,937
Int. Cl. C22d *3/08*; B01k *3/00*
U.S. Cl. 204—68 9 Claims

Method and apparatus for continuous electrolytic production of sodium metal from sodium salts including a charging cell having feeder launders extending thence to and from a series of electrolysis cells for circulating a feed of molten

sodium and other salts from the charging cell through the electrolysis cells for electrolyzing said salts to produce sodium metal collected as such, the electrolysis cells being provided with overflow means for maintaining a constant level of molten electrolyte in each, the electrolyzed sodium and other salts being replenished in said charging cell, the latter including means for maintaining the salt feed in a molten state.



3,640,802

CATHODIC PROCESS FOR THE PREPARATION OF TETRAALKYL LEAD COMPOUNDS

Edward Harvey McDonald, 1308 De Sota, and William P. Banks, 1412 Holbrook, both of Ponca City, Okla.

Filed Aug. 31, 1970, Ser. No. 68,550

Int. Cl. C07b 29/06; C07f 7/26

U.S. Cl. 204—72 **4 Claims**

The present invention relates to a process for the preparation of tetraalkyl lead compounds wherein the anolyte comprises a solution of tetrabutyl ammonium bromide or tetrabutyl phosphonium bromide in water. In this process bromine is produced at the anode and forms a precipitate with the tetrabutyl ammonium or phosphonium bromide present. This bromine can be recovered by treating the anolyte solution with hydrogen sulfide to convert the bromide present to hydrogen bromide, sulfur and the tetrabutyl ammonium or phosphonium bromide. The sulfur is removed from the solution and the solution is then treated with ethanol to form ethyl bromide by reaction with the hydrogen bromide present in the solution. The ethyl bromide is separated from the solution and returned to the cathode compartment of the electrolytic cell whereby it is subsequently converted to tetraethyl lead. The quaternary bromide salt such as tetrabutyl ammonium or phosphonium bromide is recovered from the solution as an aqueous salt and is returned to the anode compartment of the electrolytic cell where it then becomes part of the anolyte.

3,640,803

PROCESS FOR THE PRODUCTION OF REDUCED SULFUR DYES

Horst Frind; Christian Heid, and Horst Aman, all of Frankfurt (Main)-Fechenheim, Germany, assignors to Casella Farbwerke Mainkur Aktiengesellschaft, Frankfurt (Main), Fechenheim, Germany

Filed Feb. 4, 1970, Ser. No. 8,733

Claims priority, application Germany, Feb. 7, 1969, P 19 06 083.4

Int. Cl. C07b 29/06; C09b 49/00

U.S. Cl. 204—73 **12 Claims**

The dyeing behavior of a sulfur dyestuff, whether water soluble or water insoluble, is improved by electrolytic reduction. This reduction is performed in a cell in which the dyestuff is used as the catholyte. An ionic agent, such as salt or lye may be used to improve the conductivity of the catholyte. The dyestuff concentration in the cell ranges from about 5 to 50 percent by weight and 10 to 20 percent by weight is particularly effective. A porous clay diaphragm separates the anolyte and catholyte. The anolyte is for example, an aqueous lye or salt solution. The cathode is a material having relatively high hydrogen overvoltage, such as lead and alloy steels. The anode is a noble metal such as platinum or graphite. The catholyte is agitated during the reduction and its temperature is maintained from about 25° to 200° C. and preferably from 50° to 80° C. A current density of about 0.005 to 0.05 A./cm.^{2} is employed and preferably maintained from 0.01 to 0.04 A./cm.^{2}. The reduction has an energy demand from about 0.5 to 1 kWh./kg. The termination of the reduction of water-insoluble sulfur dyestuff is determined by a spot analysis test. The end of the reduction of water-soluble sulfur dyestuffs is determined relative to hydrogen formation. After the electrolytic reduction has been terminated, the catholyte is stabilized by adding any of a number of suitable reducing agents.

3,640,804

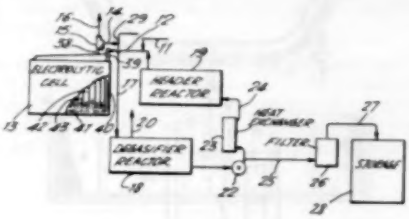
METHOD FOR CONDUCTING ELECTROLYTE TO, FROM AND THROUGH AN ELECTROLYTIC CELL

Gothe O. Westerlund, Vancouver, Canada, assignor to Chemech Engineering Ltd., Vancouver, British Columbia, Canada

Original application Apr. 18, 1966, Ser. No. 543,261, now Patent No. 3,463,722, dated Aug. 26, 1969. Divided and this application July 17, 1969, Ser. No. 842,623

Int. Cl. C01b 11/26, 11/14

U.S. Cl. 204—95 **7 Claims**



A novel procedure is provided for conducting electrolyte to, from and through an electrolytic cell. This procedure depends on maintaining the cell in a fully flooded state and using the natural pumping action due to rising entrained and/or occluded gaseous products of electrolysis to aid the passage of the electrolyte through the cell at a velocity sufficient to prevent such gaseous products of electrolysis from separating into a free gaseous phase within the cell.

3,640,805

REMOVAL OF NITRATE CONTAMINATION FROM NICKEL-PLATING SOLUTIONS

James T. Knight, Ontario, Oreg., and Parley L. Lee, Richland, Wash., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed June 13, 1969, Ser. No. 833,142

Int. Cl. C01d 7/34; C23b 5/08

U.S. Cl. 204—130 **1 Claim**

A nitrate-contaminated nickel-plating bath is purified by heating the bath to between 65° and 70° C., agitating the bath and electrolyzing the bath while providing a 10 to 20 fold greater cathode area than anode area.

3,640,806

SEMICONDUCTOR DEVICE AND METHOD OF PRODUCING THE SAME

Yoshio Watanabe, and Tetsushi Sakai, both of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Jan. 5, 1970, Ser. No. 597

Int. Cl. C23g 3/00; B23p 1/00

U.S. Cl. 204—143 GE **4 Claims**

A semiconductor device and a method of producing the same. The semiconductor device comprises a silicon single crystal including a porous substance formed so as to advance from surface area toward inside area of said silicon single crystal. The porous substance is produced on the silicon sin-

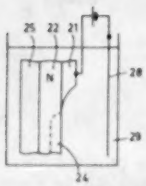
gle crystal by utilizing said crystal and a conductive metal material which is not soluble to hydrofluoric acid as electrodes, applying a positive direct current voltage to the silicon single crystal and a negative direct current voltage to the other metal electrode, and carrying out an electrolysis in an aqueous solution of the hydrofluoric acid.

3,640,807

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE AND SEMICONDUCTOR DEVICE MANUFACTURED BY SAID METHOD

Hendrikus Josephus Antonius Van Dijk, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 1, 1970, Ser. No. 51,575
Claims priority, application Netherlands, July 4, 1969, 6910274
Int. Cl. B23p *1/00*
U.S. Cl. 204—143 GE **8 Claims**



The invention relates to a method of manufacturing semiconductor devices having thin layers of a semiconductor material.

These thin layers are obtained, for example, by forming on a low-ohmic substrate a high-ohmic thin layer and then selectively removing the substrate electrolytically. Difficulties can arise during this removal when a readily conductive layer has been formed on the high-ohmic layer. The difficulties are prevented when the thickness of the high-ohmic layer is at least as large as the thickness of the depletion layer which is formed in the high-ohmic layer during the electrolytic removal of the substrate.

3,640,808

RADIOLYTIC DESTRUCTION OF NONBIODEGRADABLE ORGANIC PESTICIDES

Forrest N. Case, Oak Ridge, Tenn.; Arthur W. Garrison, Watkinsville, Ga.; Donald L. Kau, Rockwood, and David E. Smiley, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 7, 1969, Ser. No. 864,521
Int. Cl. B01j *1/10*
U.S. Cl. 204—158 HE **1 Claim**

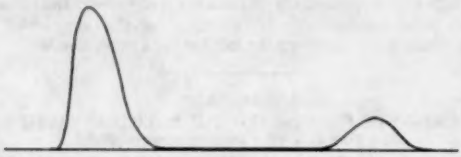
This invention relates to a method for treating industrial waste solutions containing nonbiodegradable organic pesticides which comprises saturating the solution with oxygen and then irradiating the pressurized solution until the pesticide has been decomposed into nontoxic constituents to that degree required for safe disposal.

3,640,809

CHEMICALLY HARDENED GELATIN-SEPARATING MEDIUM FOR CHROMATOGRAPHY AND ION EXCHANGE AND METHOD OF MAKING THE SAME

Alfred Polson, and Woolf Katz, both of Claremont Cape Town, Republic of South Africa, assignors to South African Inventions Development Corporation, Pretoria, Republic of South Africa

Filed Dec. 10, 1968, Ser. No. 782,652
Claims priority, application Republic of South Africa, Dec. 18, 1967, 67/7563
U.S. Cl. 204—180 G **34 Claims**



Selected gelatin, in particular the high molecular weight fraction obtained by fractionation with PEG is chemically hardened e.g. with tanning agents and used in a form of beads for exclusion chromatography and/or ion exchange or as a continuous body for electrophoresis. Ion exchange properties may be suppressed or enhanced as required by chemical treatment of the gelatin or by the choice of conditions during separation (pH, salt content). Ion-exchange properties are calibrated by electro-osmosis.

3,640,810

STEAM RINSING OF ELECTROCOATED ARTICLES

Joseph E. Plasynski, Arnold, and Robert D. Jerabek, Glenshaw, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 10, 1969, Ser. No. 884,029
Int. Cl. B01k *5/02*; **C23b** *13/00*
U.S. Cl. 204—181 **16 Claims**

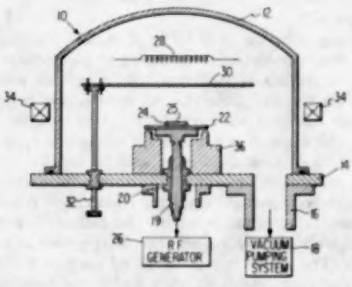
Method of removing dragout from an article which has been electrocoated, utilizing steam as a rinsing agent to remove the dragout. The use of steam produces a rinse water of appreciably higher solids than is achieved by the use of water.

3,640,811

METHOD OF METALIZING SEMICONDUCTOR DEVICES

John Louis Vossen, Jr., Bedminster, N.J., assignor to RCA Corporation

Filed Nov. 3, 1969, Ser. No. 873,299
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **3 Claims**



A semiconductor device is placed in a vacuum system and is sputter-etched by a radiofrequency glow discharge for a

period of time sufficient to remove impurities and residual oxide layers from the contact surfaces of the device. A quantity of metal is then evaporated onto the purified surface while maintaining the glow discharge so that the metal is partially ionized and accelerated towards the purified surface, and thereby forms a solid solution with the semiconductor to provide a direct ohmic contact therewith without having to subsequently sinter the metal deposit.

3,640,812

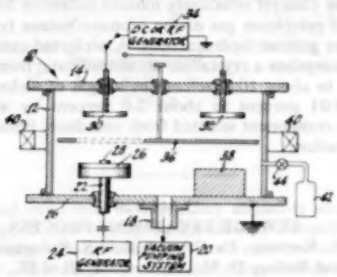
METHOD OF MAKING ELECTRICAL CONTACTS ON THE SURFACE OF A SEMICONDUCTOR DEVICE

John Louis Vossen, Jr., Bedminster, and Joseph Henry Banfield, Plainfield, both of N.J., assignors to RCA Corporation

Filed Sept. 2, 1970, Ser. No. 68,909

Int. Cl. C23c *15/00*

U.S. Cl. 204—192 **12 Claims**



The semiconductor device and a metal backing plate are simultaneously sputter etched so that some of the backing plate metal is back scattered onto the device and forms a thin metal-semiconductor alloy region in the semiconductor contact openings. At least one layer of electrode metal is then deposited on the device surface and the alloy regions. Part of the metal layer is then removed to define the desired electrode leads.

3,640,813

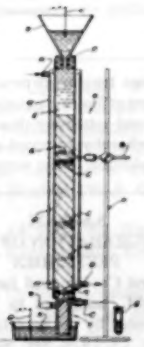
ADAPTER FOR A MACROMOLECULE SEPARATION DEVICE

Samuel T. Nerenberg, 21 Hayward Ct., Burlingame, Calif.

Filed June 9, 1969, Ser. No. 831,509

Int. Cl. B01k *5/00*

U.S. Cl. 204—299 **10 Claims**



A device for adapting an upstanding column to separate macromolecules in preparative amounts by means of electrophoresis, chromatography and electrochromatography carried out in a granular or nongranular gel medium disposed in the column. One device contains an electrically conductive, self-supporting gel disposed within a tubular housing adapted to sealingly engage the lower portion of the column. Channels may be provided in the adapter gel for fluid ingress to the upper gel surface and egress therefrom. A method for forming the adapter including electrophoresis and electrochromatography performed in a single column.

3,640,814

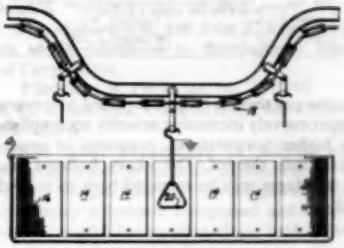
ELECTROCOATING APPARATUS

Robert L. Koch, II, and Gilman Tredwell, both of Evansville, Ind., assignors to Ashdee Corp., Evansville, Ind.

Filed Mar. 17, 1965, Ser. No. 440,410

Int. Cl. B01k *5/02*

U.S. Cl. 204—300 **6 Claims**



An electrocoating arrangement employing at least two tank baths for improved coating quality, each tank bath containing a resinous water-soluble paint, and a specific tank-article arrangement which provides a high safety factor in that the tank and the article have the same electrical polarity.

3,640,815

METHOD FOR SURFACE TREATMENT OF NICKEL AND COBALT BASE ALLOYS

Charles W. Schwartz, Whitehall, Mich., and Richard W. Martini, Scotia, N.Y., assignors to Howmet Corporation, New York, N.Y.

Filed Sept. 8, 1969, Ser. No. 856,188

Int. Cl. C23f *17/00*; **C23c** *9/00*

U.S. Cl. 204—38 S **14 Claims**

The treatment of high nickel and cobalt base alloy to improve the corrosion resistance of parts formed thereof by first applying a coating of nickel and then subjecting the part to diffusion coating to aluminize the surface.

3,640,816

MULTIPLE STAGE PROCESS FOR PRODUCING LIGHT LIQUIDS FROM COAL

Willard C. Bull, Prairie Village, and Bruce K. Schmid, Shawnee Mission, both of Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

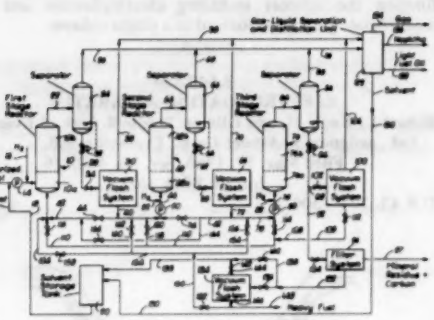
Filed Dec. 8, 1969, Ser. No. 883,182

Int. Cl. C10g *1/00*

U.S. Cl. 208—10 **10 Claims**

A multiple stage process for producing light liquids from coal wherein a slurry of pulverized coal, a solvent therefor and hydrogen is charged under pressure into a first reaction zone where the temperature thereof is elevated and maintained at such level until substantially all of the coal is dissolved. Gases and light liquids produced by partial hydrogenation of the reaction products are separated from the heavy bottoms and the latter are charged to another reaction zone under pressure where the charge along with an added quantity of hydrogen are heated to a higher tempera-

ture than present in the first zone so as to hydrocrack the constituents and produce additional quantities of gases and light liquids which are then separated from the heavy bottoms. The gases and light liquids from each stage are selectively segregated in a separation and distillation unit. Two or more reaction zones in series relationship may be employed



with the charges thereto being subjected to treatment conditions of successively increasing severity accomplished by successively higher temperatures, pressures or residence times or combinations thereof. The heavy bottoms from one or more of the stages may be recycled back to preceding stages if desired.

3,640,817
HYDROCARBONACEOUS BLACK OIL CONVERSION PROCESS

Mark J. O'Hara, Prospect Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

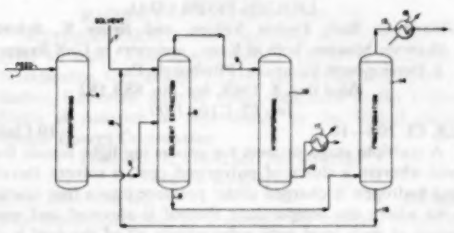
Filed May 13, 1970, Ser. No. 37,023
Int. Cl. B01j *11/82*; **C10g** *13/02, 23/02*
U.S. Cl. 208—59 **7 Claims**

Asphaltene-containing hydrocarbonaceous black oils are subjected to conversion conditions in a two-stage process. The physical characteristics of the catalytic composite disposed within the individual stages, or reaction zones, are different. This difference in physical characteristics is directed toward macropore volume, and is maintained whether the chemical composition is the same, or varies.

3,640,818
HYDROFORMING NAPHTHAS

Glen P. Hamner, Baton Rouge, La., assignor to Esso Research and Engineering Company

Filed Oct. 31, 1969, Ser. No. 872,843
Int. Cl. C10g *39/00*
U.S. Cl. 208—65 **5 Claims**



Virgin or cracked naphtha is hydroformed under mild conditions to mainly convert naphthenes to aromatics, the aromatics are extracted and the paraffinic raffinate is hydroformed under still moderate but more severe conditions. If desired the raffinate and extract can be separately fractionated to yield a selected fraction from the raffinate for hydroforming and a heavy fraction from the extract for hydrocracking.

3,640,819
INHIBITING LPG PRODUCTION IN A HYDROCRACKING PROCESS

Charles H. Watkins, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

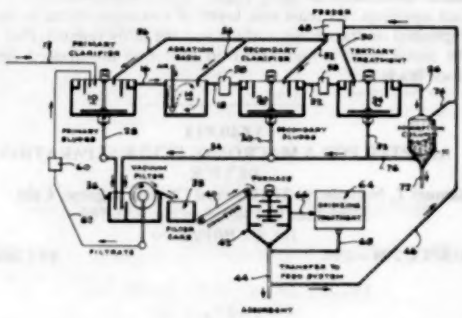
Filed June 12, 1969, Ser. No. 832,839
Int. Cl. C10g *13/02*; **B01j** *11/40*
U.S. Cl. 208—111 **5 Claims**

A catalystic composite of a porous carrier material, a nickel component and a metal component selected from Groups I, II or V of the Periodic Table. When utilized in a hydrocracking process, to produce lower-boiling hydrocarbon products, for example gasoline boiling range hydrocarbons, the catalyst effectively inhibits excessive formation of liquefied petroleum gas of the propane/butane type, as well as lighter gaseous hydrocarbons. A preferred catalytic composite comprises a crystalline aluminosilicate, from about 0.1 percent to about 10.0 percent by weight of nickel and from about 0.01 percent to about 2.0 percent by weight of a metallic component selected from vanadium, lithium, beryllium or barium.

3,640,820
SEWAGE TREATMENT PROCESS

Frank N. Kemmer, La Grange; Reid S. Robertson, Glen Ellyn, and Rodney D. Mattix, Lemont, all of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 852,421, Aug. 22, 1969. This application Jan. 11, 1971, Ser. No. 77,047
Int. Cl. C02c *1/06*
U.S. Cl. 210—6 **2 Claims**



A continuous sewage treatment process for upgrading the quality of sewage plant effluent by converting sewage sludges to active substances and returning these active substances to the sewage system whereby removal of dissolved contaminants occurs by the addition of the active substances.

3,640,821
REDUCTIVE DEGRADATION OF HALOGENATED PESTICIDES

Keith H. Sweeny, West Covina, and James R. Fischer, Claremont, both of Calif., assignors to The United States of America as represented by the Secretary of the Interior

Filed Dec. 23, 1970, Ser. No. 101,201
Int. Cl. C02c *5/02*
U.S. Cl. 210—59 **6 Claims**

Halogenated organic pesticides, typified by DDT, chlordane, lindane and the like, are reacted with metallic zinc

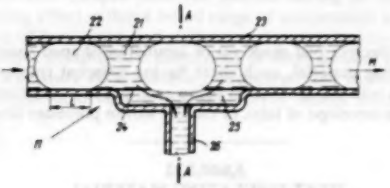
under mildly acid conditions to produce less highly halogenated degradation products of lower toxicity.

3,640,822

METHOD AND AN APPARATUS FOR SEPARATING A SEGMENTATION MEDIUM FROM A STREAM OF A SEGMENTED MAIN FLUID

Jiri Hrdina, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie, Prague, Czechoslovakia

Filed Sept. 15, 1969, Ser. No. 857,956
Claims priority, application Czechoslovakia, Sept. 19, 1968, 6571/68
Int. Cl. B01d *19/00*
U.S. Cl. 210—65 **8 Claims**



Segmented main fluid in a capillary stream is allowed to flow through a main tubing equipped with a capillary slot communicating with an offtake pipe. Conditions within the apparatus are maintained such that capillary forces and surface tension inherent in the elements of the segmentation medium and other parts of the system prevent their passage through the capillary slot, through which the main fluid only is taken off in a continuous stream. The length of the capillary slot in the direction of the main capillary tubing axis exceeds the maximum contact length of a segmentation medium element; the main fluid may be taken off substantially from a single one only, or from not more than two neighboring segments of the main medium, so that contamination by the contents of other segments is negligible.

3,640,823

FLAME-RETARDANT COMPOSITION

Roger C. Linderman, and Charles D. Cline, both of Charlotte, N.C., assignors to CPC International, Inc.

Filed Mar. 9, 1970, Ser. No. 17,894
Int. Cl. C09k *3/28*
U.S. Cl. 252—8.1 **10 Claims**

A composition which when applied to textile fabrics imparts flame retardancy. The composition is a combination of an aziridinyl phosphine oxide or sulfide and a phosphoric amide.

3,640,824

PARAFFIN INHIBITOR IN CRUDE OIL WITH HIGH-MOLECULAR WEIGHT HIGHLY BRANCHED POLYETHYLENE

Salim M. Bucaram, and Lawrence V. Collings, both of Tulsa, Okla., assignors to Sinclair Oil & Gas Company, Tulsa, Okla.

Filed Nov. 19, 1965, Ser. No. 508,834
Int. Cl. E21b *43/00*; **C09k** *3/00*
U.S. Cl. 252—8.3 **8 Claims**

A paraffin inhibitor for use in treating crude oil which contains as the essential ingredient in an amount effective to inhibit paraffin deposition, polyethylene having a molecular weight in excess of about 6,000 and a structure having at least 10 percent branching. The inhibitor may additionally contain naphthalene, microcrystalline wax having a melting point in excess of about 160° F. and/or asphaltenes.

3,640,825

DRILLING FLUID

Jack H. Kolaian, Wappingers Falls, N.Y., assignor to Texaco, Inc., New York, N.Y.

Original application Apr. 25, 1967, Ser. No. 633,434. Divided and this application Apr. 27, 1970, Ser. No. 32,354
Int. Cl. C10m *3/26, 3/24, 3/14*
U.S. Cl. 252—8.5 C **14 Claims**

An aqueous drilling fluid dispersant and a method of drilling wells using said drilling fluid which contains a substituted dihydroxybenzene compound as the dispersant, namely, a dihydroxybenzene compound selected from the group consisting of a 1,2-dihydroxybenzene containing as a substituent in the 4 position a nitro-, a chloro-, a formyl-, or a (2'-carboxyethenyl)-group and mixtures of said compounds.

3,640,826

GRAFT COPOLYMERS OF ACRYLIC ACID AND POLYHYDROXY POLYMERIC COMPOUNDS FOR TREATING CLAYS

William J. Lang, Libertyville, and John J. Krajewski, Wheeling, both of Ill., assignors to International Minerals & Chemical Corporation

Filed Sept. 4, 1968, Ser. No. 757,399
Int. Cl. C10m *3/22*; **C08b** *21/24*; **C08f** *29/100*
U.S. Cl. 252—8.5 A **20 Claims**

Water-soluble graft copolymers of acrylic acid with polyhydroxy polymeric compounds containing up to about 10.0 percent by weight, based on the weight of acrylic acid, of the polyhydroxy polymeric compound and water-soluble salts thereof are useful for treating clays, such as to render them especially useful in well drilling.

3,640,827

PHOSPHATE GLASS BODIES

Charles William Lutz, Clark, N.J., assignor to FMC Corporation, New York, N.Y.

Filed Oct. 9, 1968, Ser. No. 766,257
Int. Cl. C09k *1/36*; **E21b** *37/00*
U.S. Cl. 252—8.55 **10 Claims**

Molded internally stressed bodies of phosphate glass of controlled solubility, such as small spheres of sodium phosphate glass containing one or more multivalent metal oxides and having moderate internal stress.

3,640,828

LUBRICANT COMPOSITIONS FOR MASSES OF POLYVINYL CHLORIDE AND PROCESS FOR MAKING SAME

Walter Brotz, Gersthofen, and Bruno Dallmann, Augsburg, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft Vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed Oct. 17, 1968, Ser. No. 768,384
Claims priority, application Germany, Oct. 21, 1967, F 53 864
Int. Cl. C10m *7/24, 7/22*
U.S. Cl. 252—17 **2 Claims**

For the processing of masses of polyvinyl chloride lubricant compositions are proposed which consist of 20 to 80

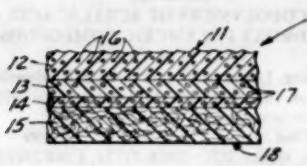
percent by weight of a metal soap or synthetic ester wax containing metal soap and 80 to 20 percent by weight of a hydrocarbon wax and which enable a particularly high output of plastics material and consequently an increased speed of processing to be obtained, for example, in injection-moulding processes.

3,640,829

MICROPOROUS PRODUCTS

Robert L. Elton, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 20, 1969, Ser. No. 867,538
Int. Cl. B32b *3/26*; **C08g** *22/44*; **D06n** *3/14*
U.S. Cl. 161—159 **9 Claims**



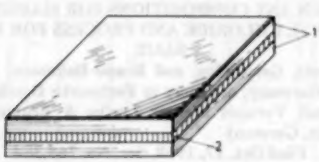
In the disclosed method of making a microporous sheet material a heat-formed (extruded, calendered, or pressed) film comprising (1) a polyurethane (preferably combined with an epoxidized soybean oil processing aid—a water insoluble plasticizer can also be included) capable of forming a nonporous film having a storage shear modulus (G') of about 0.4 to 5×10^8 dynes/cm.^{2} and a loss tangent at 0.2 cycle/sec. less than 0.5, both measured at 23° C., and (2) distributed throughout the film, a plurality of <30 micron salt (e.g. NaCl) particles, is annealed prior to leaching of the salt from the film with an aqueous medium. The resulting microporous film is useful in making leatherlike sheet materials. Preferably, the film is embossed prior to leaching but after annealing.

3,640,830

VIBRATION DAMPED SANDWICH SYSTEMS HAVING INTERLAYERS OF VINYL ACETATE-ETHYLENE-ETHYLACRYLATE COPOLYMERS

Hermann Oberst; Leonhard Reihs, both of Hofheim/Taunus; Joachim Ebigt, Mainz; Gunther Duve, Frankfurt/Main, and Alfred Schommer, Bad Soden/Taunus, all of Germany, assignors to Farbwerke Hoeschst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Continuation-in-part of application Ser. No. 630,964, Apr. 14, 1967, now abandoned. This application Oct. 19, 1970, Ser. No. 82,111
Claims priority, application Germany, Apr. 23, 1966, F 49 030
Int. Cl. B32b *15/08*; **C08f** *15/20*; **E04b** *1/86*
U.S. Cl. 161—165 **3 Claims**



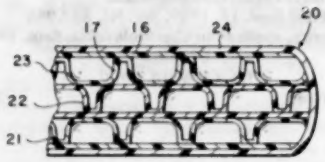
Vibration damped sandwich systems having an improved damping effect within a broad range of temperature and consisting of hard plates and a vibration damping interlayer, said interlayer comprising a copolymer of ethylene, vinyl acetate, ethyl-acrylate and acrylic and/or methacrylic acid.

3,640,831

PROTECTIVE BODY PAD

Lawrence J. Gardner, Dallas, and Donald R. Cochren, Richardson, both of Tex., assignors to Protective Pads, Inc., Dallas, Tex.

Filed Dec. 15, 1969, Ser. No. 884,840
Int. Cl. B32b *3/12*
U.S. Cl. 161—92 **5 Claims**



A protective pad made up of lamination-shaped sheets of cushioning material, each sheet having adjacent trapped air pockets with the lamination being enclosed in a moisture impervious envelope of latex or closely woven polyester fiber.

3,640,832

HEAT-INSULATING MATERIAL

Otmar J. G. Kurz, Eltville, Germany, assignor to Verolme Vacuumtechnik Aktiengesellschaft, Eltville, Germany

Filed Feb. 6, 1969, Ser. No. 797,025
Int. Cl. B32b *3/26, 7/02, 15/02*
U.S. Cl. 161—160 **17 Claims**

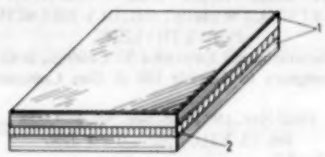
A carrier sheet of heat-resisting plastics material is permanently secured to a heat-insulating backing. A vapor-deposited, reflecting metal layer is carried by said carrier sheet on the side thereof which is remote from said backing. A wear-resisting coating, which is permeable to radiant heat, covers said metal layer on the side thereof which is remote from said carrier sheet.

3,640,833

VIBRATION DAMPED SANDWICH SYSTEMS HAVING INTERLAYERS OF VINYL ACETATE-ETHYLENE-N-BUTYLACRYLATE COPOLYMERS

Hermann Oberst; Leonhard Reihs, both of Hofheim/Taunus; Joachim Ebigt, Mainz; Gunther Duve, Frankfurt/Main, and Alfred Schommer, Bad Soden/Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Continuation-in-part of application Ser. No. 631,080, Apr. 14, 1967, now abandoned. This application Oct. 19, 1970, Ser. No. 82,112
Claims priority, application Germany, Apr. 23, 1966, F 49 031
Int. Cl. B32b *15/08*; **C08f** *15/20*; **E04b** *1/86*
U.S. Cl. 161—165 **3 Claims**



Vibration damped sandwich systems having an improved damping effect within a broad range of temperature and consisting of hard plates and a vibration damping interlayer, said interlayer comprising a copolymer of ethylene, vinyl acetate, n-butyl-acrylate and acrylic and/or methacrylic acid.

3,640,834

VIBRATION DAMPED SANDWICH SYSTEMS HAVING INTERLAYERS OF COPOLYMERS OF VINYL ACETATE, ETHYLENE AND MIXTURES OF ISONONANE-, ISODECANE- AND ISOUNDECANE-CARBOXYLIC ACID VINYL ESTERS

Hermann Oberst; Leonard Reihs, both of Hofheim, Taunus; Joachim Ebigt, Mainz; Gunther Duve, Frankfurt, Main, and Alfred Schommer, Bad Soden, Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt, Main, Germany

Continuation-in-part of application Ser. No. 630,962, Apr. 14, 1967, now abandoned. This application Oct. 19, 1970, Ser. No. 82,174

Int. Cl. B32b *7/02*, *15/08*; E04b *1/99*

U.S. Cl. 161—165 3 Claims

Vibration damped sandwich systems having an improved damping effect within a broad range of temperature and consisting of hard plates and a vibration damping interlayer, said interlayer comprising a copolymer of vinyl acetate, ethylene and a mixture of isononane-, isodecane- and isoundecane-carboxylic acid vinyl esters and acrylic and/or methacrylic acid.

3,640,835

VIBRATION DAMPED SANDWICH SYSTEMS HAVING INTERLAYERS OF COPOLYMERS OF ETHYLENE AND MIXTURES OF ISONONANE-, ISODECANE AND ISOUNDECANE-CARBOXYLIC ACID VINYLESTERS

Hermann Oberst; Leonhard Reihs, both of Hofheim, Taunus; Joachim Ebigt, Mainz; Gunther Duve, Frankfurt, Main, and Alfred Schommer, Bad Soden, Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt, Main, Germany

Continuation-in-part of application Ser. No. 630,963, Apr. 14, 1967, now abandoned. This application Oct. 19, 1970, Ser. No. 82,177

Int. Cl. B32b *7/02*, *15/08*; E04b *1/99*

U.S. Cl. 161—165 3 Claims

Vibration damped sandwich systems having an improved damping effect within a broad range of temperature and consisting of hard plates and a vibration damping interlayer, said interlayer comprising a copolymer of ethylene with a mixture of isononane-, isodecane- and isoundecane-carboxylic acid vinyl esters and acrylic and/or methacrylic acid.

3,640,836

VIBRATION DAMPED SANDWICH SYSTEMS HAVING INTERLAYERS OF VINYL ACETATE-ETHYLENE COPOLYMERS

Hermann Oberst; Leonhard Reihs, both of Hofheim, Taunus; Joachim Ebigt, Mainz; Gunther Duve, Frankfurt, Main, and Alfred Schommer, Bad Soden, Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt, Main, Germany

Continuation-in-part of application Ser. No. 631,081, Apr. 14, 1967, now abandoned. This application Oct. 19, 1970, Ser. No. 82,179

Int. Cl. B32b *7/02*, *15/08*; E04b *1/99*

U.S. Cl. 161—165 3 Claims

Vibration damped sandwich systems having an improved damping effect within a broad range of temperature and consisting of hard plates and a vibration damping interlayer, said interlayer comprising a copolymer of ethylene, vinyl acetate and acrylic and/or methacrylic acid.

3,640,837

THERMALLY INSULATING TRANSPARENT LAMINATED GLASS WITH ALKALI METAL SILICATE INTERLAYER

Rudolf Gaeth, Limburgerhof; Fritz Stastny, Ludwigshafen; Rudolf Breu, Lambsheim, and Friedhelm Gaertner, Frankenthal, all of Germany, assignors to Badische Anilin-& Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 30, 1969, Ser. No. 889,299

Claims priority, application Germany, Jan. 2, 1969, P 19 00 054.5

Int. Cl. B32b *17/06*

U.S. Cl. 161—165 4 Claims

Thermally insulating and transparent laminated glass consisting of at least two superimposed sheets of glass with an interlayer of a solid aqueous alkali metal silicate between each two sheets of glass.

3,640,838

IONICALLY INTERACTING POLYMERS

Sui-Wu Chow, and Walter H. Smarook, both of Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 669,291, Sept. 20, 1967, now abandoned. This application June 24, 1970, Ser. No. 49,568

Int. Cl. C08f *29/34*; B32b *9/00*

U.S. Cl. 161—190 14 Claims

Reversibly cross-linked, thermoplastic, normally solid polymer salt compositions have been prepared by copolymerizing a prepolymer of a carboxyl containing polyolefin, having 2 to 50 mole percent carboxylic acid groups, and about 10 to 100 mole percent of its carboxyl groups neutralized with an amino vinyl monomer such as an alkylaminoalkyl acrylate, an alkylaminoalkyl methacrylate, or an amino substituted styrene with a vinyl monomer such as an alkyl acrylate, an alkyl methacrylate, acrylamide, methacrylamide, styrene, alkyl substituted styrenes, vinyl chloride, vinyl esters containing from three to 20 carbon atoms or vinyl alkyl ethers containing from three to 20 carbon atoms.

These polymer salt compositions are particularly useful in that they exhibit a high degree of adhesion to plasticized vinyl chloride resins, unlike most other commonly known adhesives, as well as other substrates.

3,640,839

FILTER PAPER FOR OIL FILTERS

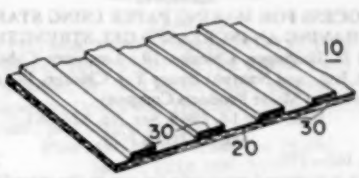
Tuguo Ochiai, Kanagawa, Japan, assignor to Tokyo Roki Kabushiki Kaisha, Kanagawa, Japan

Filed Sept. 5, 1968, Ser. No. 767,547

Claims priority, application Japan, July 13, 1968, 43/49204

Int. Cl. B07b *11/04*; D21f *11/08*

U.S. Cl. 162—129 2 Claims



A filter paper for oil filters has a coarse web capable of passing particles of granular size of about 40 μ maximum diameter and a plurality of dense web strips superposed in parallel upon the coarse web and combined therewith at fixed intervals, the dense web being capable of passing particles of granular size of about 15 μ maximum diameter.

3,640,840

COMPONENT REACTION PRODUCT AND PROCESS FOR INCREASING THE WET STRENGTH OF PAPER

Heinz Zieman, Leichlingen; Wolfgang Lehmann, Leverkusen, and Gerhard Troemel, Pesch, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 18, 1969, Ser. No. 808,326
Claims priority, application Germany, Feb. 10, 1969, P 19 06 450.7; Mar. 27, 1968, P 17 71 043.9
Int. Cl. D21h *3/36*
U.S. Cl. 162—164 19 Claims

A reaction product and process for increasing the wet strength of paper which comprises adding to a slurry of paper fibers self-cross-linking water soluble reaction products prepared from a) epihalohydrins and/or α-dihalo-hydrins such as epichlorohydrin, b) water soluble basic polyamides such as that formed by the reaction of diethylene-triamine and adipic acid, and c) water soluble polyamines such as bis-(3-amino-propyl)-amine which contain at least two nitrogen atoms separated from one another by at least three carbon atoms and optionally also by oxygen or sulfur atoms, and contain at least two hydrogen atoms attached to different nitrogen atoms wherein the components b) and c) are used in a proportion of 1–10:1 and component a) is used in an amount of 0.5 to 1.5 mole per basic amino group.

3,640,841

METHOD FOR CONTROLLING ADHESION OF PAPER ON YANKEE DRIER WITH POLYAMIDES AND RESULTANT PRODUCTS

Alfred Edwards Winslow, Unadilla, and John Calvin Spicer, Sidney, both of N.Y., assignors to The Borden Company, New York, N.Y.

Filed Apr. 29, 1969, Ser. No. 820,306
Int. Cl. D21d *3/00*; D21h *3/36*
U.S. Cl. 162—164 9 Claims

This invention relates to a paper manufacturing process which comprises drying the formed web against a heated surface, such as present on a Yankee drier, and in particular to the improvement which comprises incorporating in said web before said drying, in an amount sufficient to achieve uniform adhesion to and release from said heated surface, a water-dispersible repulpable polyamide polyamine resin containing at least two primary amine groups and at least one secondary or tertiary amine group such as the polyamide which results from the reaction of diethylene triamine with isopthalic acid.

3,640,842

PROCESS FOR MAKING PAPER USING STARCH HAVING AN INCREASED GEL STRENGTH

Clifford H. Hullinger, Chicago, Ill.; Lawrence Cohen, Hammond, Ind., and Naoyuki Henry Yui, Chicago, Ill., assignors to American Maize Products Company

Filed May 14, 1969, Ser. No. 824,681
Int. Cl. D21h *3/28*
U.S. Cl. 162—175 3 Claims

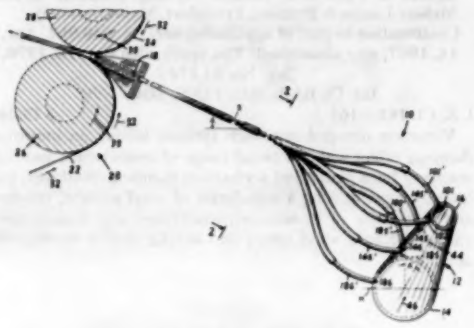
Starch is prepared especially for use in the manufacture of paper products by cooking the starch in the presence of aluminum salts at a pH of about 4.0 to 7.0. The treatment is of advantage for lowering the gelatinization temperature of the starch and for increasing the gel strength of the resulting paste. When the treated starch is added to paper pulp it increases the retention of additives and it improves the physical characteristics of the paper product.

3,640,843

TAPERED HEADER FLOW SYSTEM FOR PAPER MACHINE

John A. Means, South Norwalk, Conn., assignor to Time, Incorporated, Rockefeller Center, New York, N.Y.

Filed Apr. 17, 1969, Ser. No. 816,894
Int. Cl. D21f *1/06*
U.S. Cl. 162—343 7 Claims



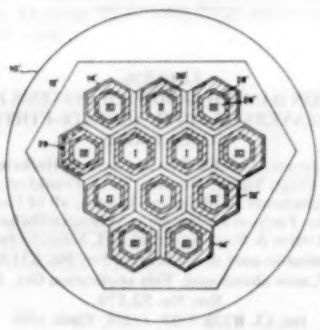
Paper stock enters a tapered header at the large end and, except for a small percentage that is recirculated, is delivered to a papermaking machine through a large number of flow channels or hoses divided into two groups. The hoses of one group are connected to the header along a first row of openings, and the hoses of the second group are connected to the header along a second row of openings. The openings are spaced apart from each other both circumferentially and longitudinally of the header. The downstream ends of all the hoses lie in a single plane, and the hoses of the two groups lie respectively in surfaces curved concavely towards each other.

3,640,844

POWER-FLATTENED SEED-BLANKET REACTOR CORE

Richard C. Shank, Clairton; Carl E. Zucker; David H. Jones; Harry F. Raab, Jr., all of Pittsburgh, and Robert T. Bayard, Bethel Park, all of Pa., assignors to The United States of America as represented by the U.S. Atomic Energy Commission

Filed Nov. 7, 1969, Ser. No. 874,735
Int. Cl. G21c *1/06*
U.S. Cl. 176—18 4 Claims



A seed-blanket breeder reactor core having a flattened power density distribution resulting from selective loading of fissile material in the reactor core to achieve a desired radial reactivity distribution. The seed geometry of fuel modules

near the periphery of the core is altered so that their reactivity worth is greater than centrally located fuel modules. The increased reactivity of the peripheral modules causes the gross power distribution in the core to flatten.

3,640,845
DYNAMIC SEAL

Charles C. Ripley, San Jose, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed July 9, 1968, Ser. No. 743,382
Int. Cl. G21c 7/16
U.S. Cl. 176—36 **3 Claims**

A control rod drive system comprising basically a neutron absorbing control rod means defining a free floating piston, actuated by liquid sodium or other reactor coolant, a dynamic seal means and fluid valve means for moving said control rod. Said dynamic seal means constructed to prevent bypass of liquid metal, such as sodium, around the piston, and including a plurality of serially disposed skirts circumferentially arranged about the piston an sleeve and having lips directed toward the high-pressure end of the piston or sleeve, and also including circumferentially disposed toroidal grooves in the piston or sleeve between each of said skirts, whereby liquid metal from said high-pressure end is deflected by said lips of said skirts to circulate in said grooves and thus prevented from passing freely around said lips. In addition, any solid particles in the liquid metal are entrapped by the circulation in the grooves of the seal means.

3,640,846
PRODUCTION OF METHANE BY BACTERIAL ACTION

Glenn E. Johnson, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Interior

Filed Apr. 29, 1969, Ser. No. 820,328
Int. Cl. C12d 3/10; C02c 1/14
U.S. Cl. 195—27 **1 Claim**

A mixture of coal and sewage solids is digested by anaerobic bacteria to produce methane.

3,640,847
PROCEDURE FOR PRODUCTION OF ALPHA-CYCLODEXTRIN

Frederick Carl Armbruster, La Grange, and William Arthur Jacaway, Jr., Downers Grove, both of Ill., assignors to CPC International Inc.

Filed Feb. 19, 1969, Ser. No. 800,766
Int. Cl. C12d 13/04
U.S. Cl. 195—31 R **11 Claims**

A process for producing alpha-cyclodextrin which comprises subjecting a gelatinized solution of starch to the action of a cyclodextrin transglycosylase enzyme in the presence of an alpha-cyclodextrin complexant and recovering an alpha-cyclodextrin product. A specific class of suitable alpha-cyclodextrin complexants usable in practicing the invention is that class of compounds which contain a saturated or unsaturated aliphatic radical with a longest straight chain carbon skeleton at least eight carbon atoms in length bonded at one end of said longest straight chain to an electronegative atom at least as electronegative as sulfur.

3,640,848
MICROBIAL REDUCTION OF Δ STEROIDS

Hendrik Eyssen, Holsbeek, Belgium, assignor to Recherche et Industrie Therapeutiques, R.I.T., Genval, Belgium

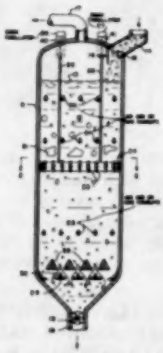
Filed Nov. 26, 1969, Ser. No. 880,400
Claims priority, application Great Britain, Sept. 12, 1969, 45,217/69
Int. Cl. C07c 167/12
U.S. Cl. 195—51 R **8 Claims**

Δ^5-Steroids are reduced to the corresponding 5,6-dihydro-5β compounds in very high yield by using the organism Eubacterium nova. Among the products are coprosterol, 24-methyl-5β-cholestan-3β-ol, and 24-ethyl-5β-cholestan-3β-ol.

3,640,849
SPENT SHALE RETORT WITH SONIC OSCILLATOR CLINKER CUTTER

Richard P. Trainer, Babylon, N.Y., assignor to Shell Oil Company, New York, N.Y.

Filed Mar. 12, 1969, Ser. No. 806,634
Int. Cl. C10b 1/04
U.S. Cl. 196—124 **3 Claims**



Vibrating grates are placed in the path of oil shale in the chamber of a retort vessel to breakup clinkers formed in the retorting process.

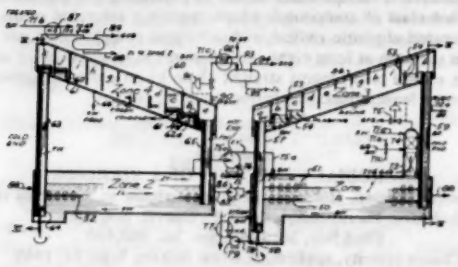
3,640,850
MULTISTAGE VAPOR-LIQUID CONTACT PROCESS FOR PRODUCING FRESH WATER FROM SALT WATER

Calvin S. Smith, Jr., El Cerrito, Calif., assignor to Harrison W. Sigworth, Orinda and Thomas N. Finical, Jr., San Carlos, Calif., part interest to each

Filed Mar. 16, 1970, Ser. No. 19,592
Int. Cl. B01d 3/00, 3/02
U.S. Cl. 203—11 **12 Claims**

The invention is an improvement in distillation process for producing fresh water from salt water. The primary heat exchange is obtained by vaporizing a water immiscible fluid (such as a hydrocarbon) which boils at a temperature lower than water which is then recondensed by direct contact. Sub-

stantial simplification of plant, maintenance, etc. results. The invention is applicable generally to aqueous solutions of non-



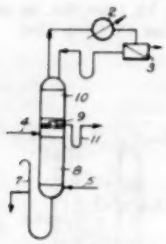
volatile solutes, and to nonaqueous solutions of nonvolatile solutes.

3,640,851

PURIFICATION OF DEHYDROLINALOOL BY FRACTIONAL DISTILLATION AND WATER WASHING

Emile Mourier, Villeurbanne, France, assignor to Rhone-Poulenc S.A., Paris, France

Original application Jan. 30, 1969, Ser. No. 795,256. Divided and this application Apr. 25, 1969, Ser. No. 835,847
Claims priority, application France, Jan. 31, 1968, 138158
Int. Cl. B01d *3/38*; **C07c**
U.S. Cl. 203—42 **3 Claims**



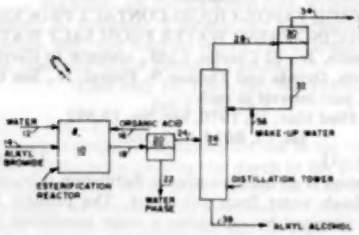
Acetylenic alcohols especially dehydrolinalool are produced by reaction of a ketone with acetylene in N-methylpyrrolidone in the presence of sodium hydroxide. The resulting mixture of dehydrolinalool and N-methylpyrrolidone is preferably separated by distillation through a column and washing the vapors with water.

3,640,852

SEPARATION OF ALKYL BROMIDES FROM THE CORRESPONDING CARBON NUMBER ALCOHOL BY DISTILLATION WITH WATER

Barrett L. Cupples, Plum Boro, and Clarence R. Murphy, Allison Park, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 23, 1970, Ser. No. 21,829
Int. Cl. B01d *3/34*; **C07c** *19/00*
U.S. Cl. 203—96 **9 Claims**



An alkyl bromide having from six to 12 carbon atoms per molecule is separated from an alkyl alcohol having the same number of carbon atoms per molecule by distillation in the presence of water.

3,640,853

ADHESION OF NONCONDUCTING AND CONDUCTING MATERIALS

Robert J. Ryan, Trenton, N.J., assignor to RCA Corporation

Filed Dec. 27, 1968, Ser. No. 787,342
Int. Cl. C23b *5/48*
U.S. Cl. 204—15 **10 Claims**

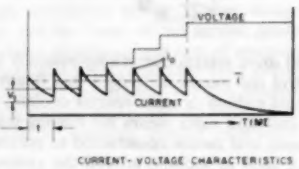
An improved metal-to-substrate bond is attained by applying a resinous adhesive mixture to the surface of a nonconducting substrate, the mixture having finely divided particles dispersed therethrough. The particles are thereafter removed from the mixture to provide a microporous tortuous structure upon the substrates. Subsequently deposited metals are keyed into and upon the microporous structural layer to result in greatly improved peel strengths.

3,640,854

CONTINUOUS FORMING OF METAL OXIDES

Gerhart P. Klein, Manchester, Mass., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Dec. 10, 1969, Ser. No. 883,887
Int. Cl. C23b *9/00*; **B01k** *3/00*
U.S. Cl. 204—28 **9 Claims**



CURRENT-VOLTAGE CHARACTERISTICS

A method is disclosed for the continuous forming of metal oxides, for example, film forming (i.e. tantalum) strip, by passing the metal through electrolyte jets in contact with counterelectrodes which provide for stepwise increases in the formation voltage.

3,640,855

C-ALKYLOXY SUBSTITUTED TERT.-BUTYL AMINE AS LUBRICATING OIL DETERGENT

Nicolaas Bakker, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sept. 6, 1968, Ser. No. 758,123
Int. Cl. C10m *1/38, 1/32, 1/20*
U.S. Cl. 252—32.7 **5 Claims**

Tert.-butyl amines having an alkyl group of at least 10 carbon atoms bonded through a heteroatom to carbon find use as detergents in lubricating oils.

3,640,856

POLYBUTENE CONTAINING SOLUBLE OILS

Sven A. Olund, San Rafael, Calif., assignor to Cheveron Research Company, San Francisco, Calif.

Filed Jan. 27, 1969, Ser. No. 794,368
Int. Cl. C10m *1/40, 3/18*
U.S. Cl. 252—33.2 **7 Claims**

Soluble oils are disclosed which contain, as the principal component, polybutene of 200–500 molecular weight. Also present are an organic dispersant and a C_{18} straight-chain carboxylic acid salt.

3,640,857

EXTREME PRESSURE LUBRICANTS CONTAINING DIALKYL 1,2,2,2-TETRAHALOETHYL PHOSPHATES

John A. Schneider, and John B. Moran, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 24, 1969, Ser. No. 844,661
Int. Cl. C10m *1/46*
U.S. Cl. 252—49.9 5 Claims

Lubricating oils containing a small but effective amount of a dialkyl 1,2,2,2-tetrahaloethyl phosphate have been discovered to have excellent extreme pressure characteristics.

3,640,858

DUAL PURPOSE LUBRICATING COMPOSITIONS

Stephen J. Harr, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 14, 1968, Ser. No. 775,917
Int. Cl. C10m *7/44*
U.S. Cl. 252—49.8 12 Claims

This invention concerns dual-purpose packing compositions compatible with synthetic and natural lubricating oils comprising from about 30 to 50 parts by weight of a microcrystalline wax having a melting point about 50°–75° C. admixed with about 70 to 50 parts by weight of an aliphatic ester component derived from the esterification of aliphatic alcohols, diols and polyols or their ethers by aliphatic mono- or dicarboxylic acids. The packing compositions can contain from about 0.5 to 5 parts by weight of one or more extreme pressure or load bearing additives.

3,640,859

GREASE COMPOSITIONS

Joseph F. Messina, Delaware, and Henry Gisser, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of the Army

Filed Sept. 24, 1969, Ser. No. 860,801
Int. Cl. C10m *7/28*
U.S. Cl. 252—54 4 Claims

Stable grease compositions having excellent extreme pressure properties, among other, the grease consisting of about 68–73.5 weight percent bis(m-phenoxyphenyl) ether having a pour point of +4.5° C., balance being tetrafluoroethylene polymer having a molecular weight 10,000–50,000, softening point 321.1° C., particle size less than 30 microns in diameter, and supplied as a 7.5 percent suspension in trichlorotrifluoroethane.

3,640,860

LUBRICATNG COMPOSITION AND METHOD FOR TREATING METAL-MOLD INTERFACE IN CONTINUOUS CASTING OPERATION

Virgil A. Miller, Park Forest, Ill., assignors to Atlantic Richfield Company, New York, N.Y.

Filed June 2, 1969, Ser. No. 829,715
Int. Cl. C10m *1/26*
U.S. Cl. 252—56 16 Claims

A lubricating composition is prepared suitable for lubricating the interface of liquid metal and mold during the continuous casting of metals. This lubricating composition contains both the dimer and trimer of an unsaturated fatty acid, a glyceride oil, e.g., triglyceride, as a solubilizing agent, and a mineral lubricating oil having a low-carbon residue and low-aromatic carbon content which can be prepared by a two-stage catalytic hydrogenation process.

3,640,861

PROCESS OF MAKING TONER

Shwang Hsia, New City, N.Y., assignor to Frye Industries Inc., New York, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,374
Int. Cl. G03g *9/24*
U.S. Cl. 252—62.1 5 Claims

A process for producing solid electrostatic toner wherein pigment is milled into a molten resin while the resin contains a gas dispersed therethrough, cooling the resin to form a friable solid and comminuting said solid to toner particle size.

3,640,862

LIQUID CATIONIC FLOTATION COMPOSITION

Elmer William Gieseke, Latrobe, Pa., and Frank Peterson Howald, Salt Lake City, Utah, assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 8, 1968, Ser. No. 751,024
Int. Cl. B03d *1/02*
U.S. Cl. 252—61 3 Claims

A liquid, temperature-stable, cationic ore concentration flotation composition prepared from an aliphatic alcohol and the reaction product of a fatty acid, diethylene triamine, and glacial acetic acid.

3,640,863

LIQUID ELECTROSTATIC HAVING PIGMENT PARTICLES COATED WITH A CYCLIZED RUBBER

Zenjiro Okuno; Akinori Mizuno, and Ikuyo Kondoh, all of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed May 28, 1969, Ser. No. 828,784
Claims priority, application Japan, June 5, 1968, 43/38516
Int. Cl. G03g *9/04*
U.S. Cl. 252—62.1 5 Claims

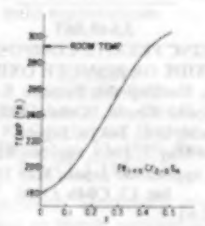
A liquid developer for use in developing an electrostatic latent image formed on an electrostatic recording material or an electrophotographic copying material which is prepared by dispersing, in a suitable carrier liquid, a toner consisting substantially of pigment particles whose surfaces are coated with a coating agent selected from the group consisting of cyclized rubber, a resin containing cyclized rubber, and a resin combining a resin having a high solubility for said carrier liquid and a resin having a low solubility for said carrier liquid.

3,640,864

FERRIMAGNETIC SEMICONDUCTING MATERIAL AND DEVICES MADE THEREFROM

Murray Robbins, Berkeley Heights, and Raymond Wolfe, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 18, 1969, Ser. No. 877,748
Int. Cl. C04b *35/00*; H01b *1/06*
U.S. Cl. 252—62.3 V 3 Claims



This discovery of a system of materials exhibiting ferrimagnetic and semiconducting properties at room temperature,

makes possible the development of classes of devices not previously realizable in the absence of refrigeration. These materials in polycrystalline and single-crystal form find application in such devices as optically modulated magnetic devices, microwave amplifiers with built-in isolation and memory elements with built-in gain.

3,640,865

NEW FERROELECTRIC MATERIALS AND PROCESS OF PREPARATION

Gerald Burns, Yorktown Heights; Edward A. Giess, Somers, and Daniel F. O'Kane, Katonah, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of application Ser. No. 821,779, May 5, 1969, now abandoned , which is a continuation-in-part of application Ser. No. 753,823, July 15, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 694,916, Jan. 2, 1968, now abandoned. This application Apr. 9, 1970, Ser. No. 27,111

Int. Cl. C04b *35/00, 35/60*

U.S. Cl. 252—62.9 **27 Claims**

New transparent ferroelectric compositions have been prepared having a tetragonal tungsten-bronze-type crystallographic structure and having the formula $x(ANbO_3) \cdot (1\text{-}x)MNb_2O_6$ where A is at least one alkali metal ion and M is an alkaline earth metal ion and where x can be from 0.12 to 0.50. These materials have large dielectric constants, (ϵ), and linear electro-optic coefficients (r), at room temperature. The value of r is significantly larger than that of $LiNbO_3$. These materials have great potential as light modulators and deflectors.

3,640,866

PIEZOELECTRIC CERAMIC COMPOSITIONS

Masamitsu Nishida, Osaka-shi, and Hiromu Ouchi, Toyonaka-shi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Aug. 21, 1967, Ser. No. 662,037

Int. Cl. C04b *35/46, 35/48*

U.S. Cl. 252—62.9 **2 Claims**

Piezoelectric ceramic compositions are provided which are characterized by high stability with temperature and time in resonant frequency and by high electromechanical coupling coefficients and high dielectric constants or by high electromechanical coupling coefficients and high mechanical quality factors. These ceramic compositions are ternary systems, in solid solution form, of the type formula

$$Pb(Mn_{1/3}Nb_{2/3})O_3 - PbTiO_3 - PbZrO_3.$$

Optimal ternary compounds are within the area ABCD of FIG. 2 of the accompanying drawings; very best compounds are defined by ABE. An especially good material consists of the solid solution of the formula

$$Pb(Mn_{1/3}Nb_{2/3})_{0.250}Ti_{0.430}Zr_{0.320}O_3.$$

3,640,867

LITHIUM-ZINC FERRITE COMPOSITION WITH ARSENIC OXIDE OR BISMUTH OXIDE ADDITIVE

Tsutomu Iimura, Hachioji-shi; Susumu Kurokawa, Mobara-shi, and Masayuki Emoto, Kodaira-shi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 7, 1969, Ser. No. 822,366

Claims priority, application Japan, May 10, 1968, 43/30903

Int. Cl. C04b *35/26*

U.S. Cl. 252—62.61 **8 Claims**

A lithium-zinc ferrite composition most suitable for use as magnetic memory cores in high-speed electronic computer, which consists of 10 to 30 mol percent of Li_2O, 3.5 to 20 mol percent of ZnO and 70 to 85 mol percent of Fe_2O_3 as the main components; and in addition at least one metal oxide selected from the group consisting of vanadium oxide, arsenic oxide and bismuth oxide as subcomponents, the content of the metal oxide being 0.01 to 1 percent by weight with respect to the main components.

3,640,868

ELECTRICAL INSULATING OIL

Albert G. Rocchini, Oakmont, and Charles E. Trautman, Cheswick, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 1, 1970, Ser. No. 24,838

Int. Cl. H01b *3/22*

U.S. Cl. 252—63 **10 Claims**

The invention relates to an electrical insulating oil, resistant to oxidation and sludging, which consists essentially of a blend of about 1 to about 25 percent by volume of a solvent-extracted residue of a naphthenic petroleum distillate oil and about 75 to about 99 percent by volume of a hydrogenated naphthenic petroleum distillate oil. The solvent-extracted residue is obtained by contacting a naphthenic petroleum distillate oil with a solvent such as furfural or nitrobenzene. The hydrogenated naphthenic petroleum distillate oil is obtained by contacting a naphthenic petroleum distillate oil with hydrogen in the presence of a catalyst such as, for example, sulfides or oxides of molybdenum and at least two iron group metals.

3,640,869

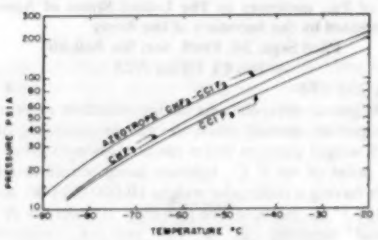
FLUOROCARBON COMPOSITIONS

Sabatino R. Orfeo, Morris Plains, and Kevin P. Murphy, Bernardsville, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 18, 1964, Ser. No. 397,407

Int. Cl. C09k *3/02*

U.S. Cl. 252—67 **4 Claims**



1. The process of producing refrigeration which comprises condensing a mixture consisting of trifluoromethane and monochlorotrifluoromethane, in which mixture the mole percent of trifluoromethane is in the range of about 20–75, and thereafter evaporating said mixture in the vicinity of a body to be cooled.

3,640,870

LUBRICANT COMPOSITIONS COMPRISING SUBSTITUTED INDANS

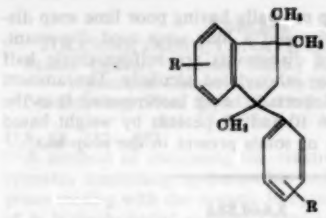
Robert M. Gemmill, Jr., Woodbury, and John W. Schick, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation

Filed June 24, 1969, Ser. No. 836,161

Int. Cl. C10m *1/16, 1/38, 1/20*

U.S. Cl. 252—59 **5 Claims**

Lubricant compositions are provided comprising a substituted indan having the structure:



in which R is at least one member of the group consisting of hydrogen, alkyl, phenyl, carboxy alkyl, carboxy phenyl, phenoxy and their thiosubstituted derivatives. The method for the preparation of these substituted indans is also provided.

3,640,871

TELLURIUM-IRON MODIFIED CHROMIUM DIOXIDES

Tadashi Kawamata; Eiichi Hirota; Toshihiro Mihara, and Yukio Terada, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Oct. 22, 1970, Ser. No. 83,167
Claims priority, application Japan, Oct. 27, 1969, 44/86295; Oct. 29, 1969, 44/87042
Int. Cl. C04b 35/12
U.S. Cl. 252—62.51 4 Claims

Tellurium-iron modified chromium dioxide having a higher magnetic coercive force is obtained by a combined addition of tellurium and iron.

When said magnetic recording powder consists essentially of 20 to 99.98 atomic percent of chromium, 0.01 to 20 atomic percent of tellurium and 0.01 to 60 atomic percent of iron, the intrinsic coercive force is higher than 400 Oersteds. The coercive force of tellurium-iron modified chromium dioxide is increased by further addition of 0.1 to 15 atomic percent of tin.

These ferromagnetic chromium dioxide powders have high coercive force and saturation magnetization. Each particle of the powders is in a uniform acicular shape and is useful in magnetic recording media.

3,640,872

AUTOMATIC TRANSMISSION FLUID

Morris A. Wiley, Fishkill; Roger G. Lacoste, Hopewell Junction; Clemence J. Henry, Newburgh, and James O. Waldbillig, Beacon, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 25, 1968, Ser. No. 770,803
Int. Cl. C09k 3/00
U.S. Cl. 252—75 7 Claims

Automatic transmission fluid comprising a mineral lubricating oil, a zinc di-(alkylphenoxyalkoxyalkyl) dithiophosphate, a nitrogen-containing methacrylate polymer, a polyethylene polyamine-alkenyl succinic anhydride reaction product, an aryl-substituted naphthylamine and an N-acyl sarcosine, and a method of operating an automatic transmission.

3,640,873

CORROSION INHIBITOR SYSTEM FOR FUNCTIONAL FLUIDS

Lowell R. Avery, and Wayne A. Conklin, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 22, 1969, Ser. No. 793,177
Int. Cl. C09k 3/00; C23f 11/16
U.S. Cl. 252—78 6 Claims

The SAE corrosion specifications and other SAE specifications for functional fluids are met by the use of an effective amount of an inhibitor system consisting essentially of:

0—81.4%	n-Dodecyldimethylamine
0—81.4%	t-Butylamine
16.6—98%	Phosphite ester of an alkylated phenol
1.8—83%	Polymerized trimethyl dihydroquinoline
0.2—9.4%	Benzotriazole

by weight.

3,640,874

BLEACHING AND DETERGENT COMPOSITIONS

Frederick William Gray, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed May 28, 1969, Ser. No. 828,782
Int. Cl. C11d 7/54
U.S. Cl. 252—95 15 Claims

Bleaching and detergent compositions comprising a water-soluble peroxide compound and an activator comprising an N-benzoylimidazole.

3,640,875

PROCESS FOR PREPARING A LIGHT DENSITY BLEACH COMPOSITION

Fred K. Rubin, Bronx, N.Y., and Carl J. Carmack, Ridgewood, N.J., assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Aug. 14, 1968, Ser. No. 752,457
Int. Cl. C11d 7/56
U.S. Cl. 252—99 8 Claims

This disclosure is concerned with a light density bleach composition in which a chlorinating agent is distributed uniformly throughout a spray-dried base. This disclosure is also concerned with a process for preparing this composition.

3,640,876

PEROXYGEN COMPOSITION CONTAINING AN ALKALI METAL SILICATE AND AN ORGANIC ACID ANHYDRIDE

Faye J. Donaghu, Buena Park, Calif., assignor to Kerr McGee Chemical Corp.

Filed Sept. 23, 1968, Ser. No. 761,708
Int. Cl. C01b 15/00; C11d 7/14, 7/54
U.S. Cl. 252—99 14 Claims

A method of increasing the oxidation potential of a water-soluble inorganic peroxy compound which is capable of forming hydrogen peroxide in an aqueous medium which comprises incorporating with said peroxy compound in said aqueous medium a water-soluble alkali metal silicate and an organic acid anhydride which is capable of reacting with said peroxy compound in said aqueous medium to form a peroxyacid of said acid anhydride. The combination of at least one alkali metal silicate and at least one organic acid anhydride with at least one inorganic peroxy compound provides a composition which interacts synergistically in an aqueous medium to provide active oxidative species of unexpectedly high oxidation potential. The oxidizing solution thus produced is an effective oxidative bleaching solution even at relatively mild temperatures.

3,640,877

DETERGENT

Michael R. R. Gobert, 1 bis, Rue de la Sabliere, 92 Courbevoie, France

No Drawing. Filed Apr. 17, 1969, Ser. No. 817,196
Int. Cl. C11d 7/18
U.S. Cl. 252—99 10 Claims

Detergent preparation containing system of glucose and glucose oxidase or starch, amyloglucosidase and glucose oxidase as precursor of hydrogen peroxide and a hydroxylamine which stabilizes the hydrogen peroxide formed during use of the detergent.

3,640,878
ALKALINE DETERGENT COMPOSITION
William Chirash, New Providence, and Richard Lerda Burke, Madison, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Filed May 29, 1969, Ser. No. 829,115
Int. Cl. C11d 7/56
U.S. Cl. 252—99 8 Claims

A dishwashing detergent composition containing sodium silicate, pentasodium tripolyphosphate and sodium fluosilicate. The latter acts to protect the overglaze patterns of fine china. Other alkali metal silicates, phosphates, carbonates, fluosilicates and chelates may be used. An antispotting agent, active oxygen, or chlorine bleaching agent (yielding hypochlorite chlorine) and an organic detergent may also be present.

3,640,879
CLEANING COMPOSITION AND METHOD OF USING SAME
Walter P. Fitzgerald, Jr., San Diego, Calif., assignor to LRC Research and Development Company, Wilmington, Del.
No Drawing. Filed May 28, 1969, Ser. No. 828,710
Int. Cl. C11d 7/54
U.S. Cl. 252—103 12 Claims

A cleaning composition especially suited for use in cleaning dental prosthetic devices comprising a mixture of lithium hypochlorite, a member selected from the group consisting of alkali metal pyrosulfate, alkali metal bisulfate and mixtures thereof, an alkali metal hydroxide and, preferably, a surface active agent.

3,640,880
HARD SURFACE CLEANER
John Robert Martin, Bebington, England, assignor to Lever Brothers Company, New York, N.Y.
No Drawing. Filed Nov. 8, 1968, Ser. No. 774,537
Claims priority, application Great Britain, Dec. 6, 1967, 55,415/67
Int. Cl. C11d 1/12
U.S. Cl. 252—55 9 Claims

A hard surface cleaning composition consisting essentially of a mixture of two olefin sulphonates, predominantly of 12 and 20 carbon chain length respectively, said mixture being the sole active or formulated in combination with anionic or nonionic surface active agents.

3,640,881
PROCEDURE FOR DRY CLEANING
Francis Selim Moussalli, Charlotte, N.C., assignor to Celanese Corporation, New York, N.Y.
No Drawing. Filed July 24, 1968, Ser. No. 747,074
Int. Cl. C09d 9/04; C11d 7/52; C23g 5/02
U.S. Cl. 252—171 11 Claims

Dry cleaning compositions containing hydrophilic optical brightener and detergent material compatible therewith can be used in conventional coin-operated, professional and, preferably, industrial dry cleaning systems to simultaneously clean and brighten textile structures and particularly white garments containing a significant manmade fiber content.

3,640,882
SULFOSUCCINATE HALF ESTER LIME SOAP DISPERSING AGENTS
William L. Groves, Jr., Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
No Drawing. Filed May 1, 1969, Ser. No. 821,074
Int. Cl. C11d 1/12, 1/14, 9/46
U.S. Cl. 252—121 1 Claim

A soap bar having improved lime soap dispersing characteristics is provided which consists essentially of a water-soluble soap normally having poor lime soap dispersing characteristics and a lime soap curd dispersant. The lime soap curd dispersants are sulfosuccinate half esters prepared from ethoxylated alcohols. The amount of the lime soap dispersant being incorporated into the soap bar is between 10 and 50 percent by weight based on the total weight of solids present in the soap bar.

3,640,883
SKIN PROTECTIVE WASHING AND CLEANSING COMPOSITIONS
Ernst Gotte, Ratingen-Tiefenbroich, Germany, assignor to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany
No Drawing. Filed Nov. 14, 1968, Ser. No. 775,921
Claims priority, application Germany, Dec. 14, 1967, H 64,776
Int. Cl. C11d 1/18, 1/38, 1/50
U.S. Cl. 252—545 4 Claims

Washing and cleansing compositions having a content of anionic surface-active agents and an effective amount of a skin protective polyamide having free amino groups, said polyamide being present in a form selected from the group consisting of the water-dispersible free amino group containing polyamides and water-soluble acid addition salts thereof and being the condensation product of 1 mol of an organic dicarboxylic acid having from 2 to 10 carbon atoms and free of other amine reacting substituents, and from 1 to 2 mols of a polyalkyleneamine of the formula

$$NH_2—(C_nH_{2n}—NH)_m—C_nH_{2n}—NH_2$$

wherein n represents an integer from 2 to 6 and m represents an integer from 1 to 10.

3,640,884
AZEOTROPIC CLEANING SOLVENTS BASED ON 1,1,2,2-TETRACHLORO-1,2-DIFLUOROETHANE
John Allan Schofield, Irvington, and Roger A. Delano, Dobbs Ferry, N.Y., assignors to Union Carbide Corporation, New York, N.Y.
No Drawing. Filed Oct. 28, 1968, Ser. No. 771,334
Int. Cl. C09d 9/00; C11d 7/52; C23g 5/02
U.S. Cl. 252—171 2 Claims

The disclosure relates to binary and ternary azeotropic mixtures of tetrachlorodifluoroethane. The binary azeotropes contain tetrachlorodifluoroethane as one component and either acetic acid, propionic acid, dioxane, monomethyl ether of ethylene glycol, ethyl acetate, isopropyl acetate or n-propyl acetate as the second components. The ternary azeotropes contain tetrachlorodifluoroethane as the first component, 1,2-dichloroethane as the second component and either methanol, ethanol or isopropanol as the third component. It has been discovered that these azeotropes may be used in solvent vapor cleaning and degreasing applications.

3,640,885
DRY, FREE FLOWING PEROXYGEN COMPOSITION WITH AN ORGANIC ACID ANHYDRIDE AND ALKALI METAL HYDRATE
Raymond C. Rhees, Whittier, Calif., assignor to Ken McGee Chemical Corporation
No Drawing. Filed Sept. 24, 1968, Ser. No. 762,151
Int. Cl. C01b 15/00
U.S. Cl. 252—186 34 Claims

A dry, stable non-segregating bleaching composition having a controllable, moderately low bulk density which comprises a mass of expanded, porous, water-soluble inorganic hydrate salt particles having at least one peroxygen compound bonded thereto. The peroxygen compound is bonded to the expanded, porous salt particles at moderately low temperatures under controlled moisture conditions.

3,640,886

TOLUENE DIISOCYANATE COMPOSITIONS

Moses Cenker, Trenton, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed Sept. 25, 1968, Ser. No. 762,629
Int. Cl. C07c *119/04*
U.S. Cl. 252—182 6 Claims

A method of increasing the reactivity of organic isocyanates containing hydrolyzable chlorides which comprises mixing with the organic isocyanate a small amount of N,N-disubstituted carbamyl chloride.

ERRATUM

For Class 252—301 see:
Patent No. 3,639,932

3,640,887

TRANSPARENT ZIRCONIA-, HAFNIA-, AND THORIA-RARE EARTH CERAMICS

Richard C. Anderson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

No Drawing. Continuation of application Ser. No. 582,519, Sept. 28, 1966. This application Apr. 6, 1970, Ser. No. 26,075
Int. Cl. C09k *3/00*; C04b *33/00*
U.S. Cl. 252—301.1 11 Claims

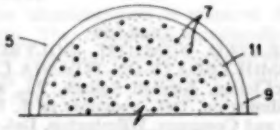
The manufacture of transparent polycrystalline ceramic bodies composed of oxides of thorium, zirconium, and hafnium and mixtures thereof with oxides of the rare earth elements 58 through 71 of the Periodic Table and mixtures thereof with or without yttria, wherein the ceramic body is in the cubic crystal system, the average ionic radius of the rare earth oxide with or without the yttria is no greater than about 0.93 A., and the difference in ionic sizes of the oxides is no greater than about 0.22 A. is disclosed.

3,640,888

CALIFORNIUM-252 NEUTRON SOURCE AND METHOD OF MAKING SAME

Russell D. Baybarz and Joseph R. Peterson, Knoxville, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 11, 1969, Ser. No. 884,089
Int. Cl. C09k *3/00*
U.S. Cl. 252—301.1 R 3 Claims



A radiation source has been provided which is free of radioactive surface contamination comprising a solid quartz bead containing a spontaneously fissionable element distributed substantially evenly within the confines of an outer glass shell. A method has been provided for preparing the source comprising sorbing a spontaneously fissionable element on quartz powder in a quartz capillary and subsequently fusing the powder and capillary to contain the neutron-emitting material.

3,640,889

FLUORESCENT SKIN-MARKING COMPOSITION

Dair J. Stewart, Madison, Wis., assignor to Mautz Paint & Varnish Company, Madison, Wis.

No Drawing. Filed Apr. 28, 1969, Ser. No. 819,989
Int. Cl. C09d *5/22*; F21k *2/00*
U.S. Cl. 252—301.2 R 10 Claims

A normally liquid, ultraviolet light-sensitive skin marking composition is disclosed as being useful for marking the skin of animals or humans, for instance to indicate areas on a patient's skin which are to be subjected to radiation therapy, for example for the treatment of cancer. The mark left by the composition is invisible in visible light but fluoresces under ultraviolet light. The composition consists essentially of polyvinyl acetate, a water-immiscible fluorescent brightening agent of the aminocoumarin type, organic solvent, and, optionally, water.

3,640,890

LITHIA SILICA GLASS LASER CONTAINING VARIOUS OTHER ALKALI OXIDES

Haynes A. Lee, Jr., Sylvania, and Charles F. Rapp, Toledo, Ohio, assignors to Owens-Illinois, Inc.

No Drawing. Continuation-in-part of application Ser. No. 595,000, Nov. 15, 1966. This application June 6, 1969, Ser. No. 831,256
The portion of the term of the patent subsequent to Oct. 7, 1986, has been disclaimed
Int. Cl. C09k *1/54*; H01s *3/16*
U.S. Cl. 252—301.4 12 Claims

Glass lasers made from glasses containing the following ingredients in mole percent:

Ingredient:	Mole percent
SiO_2	45 to 75
Al_2O_3	0 to 10
Li_2O	18 to 35

and wherein at least one additional alkali metal oxide selected from the group consisting of Na_2O, K_2O, Rb_2O, Cs_2O and mixtures is present in an amount of from 0.5 to 10 mole percent. Alkaline earth oxides such as BeO, MgO, SrO, BaO, CaO and mixtures thereof may also be present. Neodymium oxide is the laseable substance incorporated into the glasses. The glass lasers exhibit improved efficiency and have longer decay times and accommodate larger concentrations of neodymium than were present heretofore.

3,640,891

LITHIA-SILICA GLASS LASER CONTAINING VARIOUS ALKALINE EARTH OXIDES

Haynes A. Lee, Jr., Sylvania, and Charles F. Rapp, Toledo, Ohio, assignors to Owens-Illinois, Inc.

No Drawing. Continuation-in-part of application Ser. No. 595,000, Nov. 17, 1966. This application June 6, 1969, Ser. No. 831,257
The portion of the term of the patent subsequent to Oct. 7, 1986, has been disclaimed
Int. Cl. C09k *1/54*; H01s *3/16*
U.S. Cl. 252—301.4 21 Claims

Glass laser compositions based on the lithia-silica glass system containing as selected alkaline earths MgO, BeO, SrO, BaO, mixtures thereof, and mixtures containing CaO. These glasses are employed as hosts for neodymium oxide, Nd_2O_3, as the laseable substance. Good efficiencies can be obtained thereby.

3,640,892

ENCAPSULATION PROCESS AND ITS PRODUCT

Antoinette M. Purcell, Cranbury, N.J., assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed June 24, 1969, Ser. No. 836,148
Int. Cl. B01j *13/02*; B44d *1/02*
U.S. Cl. 252—316 9 Claims

A process is provided for manufacturing minute capsules, en masse, in a liquid manufacturing vehicle, which capsules have walls of a substantially homogeneous solid solution of at least two polymeric materials. The novel process includes a liquid-liquid phase separation which is accomplished by heating a solution of two polymeric materials in an organic solvent. The polymeric materials comprise polymeric capsule wall material, viz.

halogenated rubber, and polymeric liquid-liquid phase-separation-inducing material, viz, poly(ethylene-co-vinyl acetate) or poly(vinylmethyl ether), which dissolve together as a single phase in the manufacturing vehicle below a certain phase separation temperature and which exist, above the phase separation temperature, as separated components of two liquid phases.

3,640,893
ANTI-FOAM OIL

Alan David Forbes, Woking, and Neville John Hunter, Walton-on-Thames, England, assignors to The British Petroleum Company Limited, London, England

Filed Oct. 28, 1969, Ser. No. 871,886
Claims priority, application Great Britain, Nov. 12, 1968, 53,568/68
Int. Cl. B01d *17/00*
U.S. Cl. 252—321 5 Claims

Disclosed is a composition for use in combating foam formation in aqueous systems comprised of a mineral base oil and 0.1 to 25% by weight of a fatty acid product resulting from the hydrolysis of a lipid extract obtained by solvent extraction of micro-organism culture grown on a hydrocarbon substrate.

3,640,894
COMPOSITIONS AND PROCESSES FOR BREAKING PETROLEUM EMULSIONS

Ronald G. Sampson, Huntington Beach, Calif., assignor to Nalco Chemical Company, Chicago, Ill.

No Drawing. Filed July 9, 1970, Ser. No. 53,709
Int. Cl. B01d *17/04*
U.S. Cl. 252—344 10 Claims

Compositions of matter and a process breaking water-in-oil petroleum emulsions therewith, which compositions comprise a substantially water-insoluble at least partially oil-soluble product formed by the combination of (a) a diisocyanate and a polyoxyalkylated compound and (b) polyoxyalkylated alkyl phenolformaldehyde polycondensates is disclosed.

3,640,895
INHIBITION OF CORROSION USING ALKYL ARYL KETONES

Zisis Andrew Foroulis, East Orange, N.J., assignor to Esso Research and Engineering Company

No Drawing. Filed July 2, 1968, Ser. No. 741,869
Int. Cl. C23f *11/04, 11/12*
U.S. Cl. 252—396 15 Claims

Corrosion of metals by aqueous acidic solutions in a non-oxidizing atmosphere is markedly inhibited by the presence of a lower alkyl aryl ketone. A particularly effective inhibitor of this type is methyl beta-naphthyl ketone. Corrosion of chemical and petroleum process equipment handling hydrocarbon streams containing acidic gases and water vapor is minimized by the presence of the corrosion inhibitor of this invention.

3,640,896
PROCESS FOR STABILIZING FOWL RED BLOOD CELLS

Anthony J. De Casperis, Elmhurst, N.Y., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 802,263, Feb. 25, 1969. This application Apr. 13, 1970. Ser. No. 28,058
Int. Cl. A61k *27/10*; G01n *33/16*
U.S. Cl. 252—408 1 Claim

A diagnostic composition serving as a multiple-analysis hematology reference control for red blood cell and white blood cell counting, hemoglobin content and hematocrit determination.

3,640,897
ACRYLAMIDE POLYMERS AS FLOCCULANTS IN RECOVERY OF NICKEL CATALYSTS

Alfred J. Restaino, Wilmington, Del., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

No Drawing. Filed Aug. 12, 1969, Ser. No. 849,495
Int. Cl. B01j *11/02, 11/30*
U.S. Cl. 252—412 1 Claim

An improved process for the recovery and production of supported nickel hydrogenation catalyst is disclosed. The improvement being in the washing and filtration step of the recovery of the nickel and precipitation of same on the support; namely silica or carbon, to form the unactivated "green catalyst" of the process.

3,640,898
RHODIUM BASED CATALYSTS FOR THE SYNTHESIS OF 1,4-DIENES

Aaron Chung Liong Su, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 11, 1969, Ser. No. 815,486
Int. Cl. C07c *11/12*
U.S. Cl. 252—429 12 Claims

Improved catalysts are provided for the synthesis of 1,4-dienes from α-monoolefins and conjugated dienes. The catalysts are rhodium (III) salts in combination with amides, phosphoramides, phosphine oxides or water. The improved catalyst allow control of the trans-cis ratio of the 1,4-diene formed and are operable at useful rates in a wide range of solvent systems, both protonic and aprotic.

3,640,899
REACTION PRODUCT OF HYDROCARBYLMONOLITHIUM AND 1,3-BUTADIENE AS POLYMERIZATION INITIATOR

Floyd E. Naylor, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Jan. 30, 1969, Ser. No. 795,365
Int. Cl. C08d *3/06*
U.S. Cl. 252—431 R 3 Claims

Sec- or tert-organomonolithium compounds are reacted with 1,3-butadiene in the absence of added polar material to produce a multifunctional polymerization initiator.

3,640,900
HEAT TREATED BISMUTH MOLYBDATE AND PHOSPHOMOLYBDATE-ON-TITANIA CATALYSTS

William McClellan, Kennett Square, Pa., and Alvin B. Stiles, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Mar. 6, 1969, Ser. No. 805,016
Int. Cl. B01j *11/82*
U.S. Cl. 252—437 4 Claims

A bismuth molybdate- or bismuth phosphomolybdate-on-titania catalyst is made by mixing a titania sol with compounds to give an aqueous slurry which produces, after drying and calcining, bismuth oxide, molybdenum oxide and optionally, silicon oxide and phosphorus oxide, in the desired proportions. A preferred method of preparing the catalyst is to add, prior to drying, ammonium carbonate, or aqueous ammonia, to the slurry until the pH is in the range of 5–7.5. Subsequently, the catalyst is dried and calcined at temperatures above 600° but below 700° C. The resulting catalyst has the formula:

$$Bi_aP_bMo_{12}(Ti_{1-x}Si_x)_cO_d$$

where a is equal to or greater than 4, b is 0 to 2, c is 6 to 80, d is $1.5a+2.5b+36+2c$ and x is 0 to 0.5.

The catalyst produced is useful in various oxidation reactions, e.g. methanol to formaldehyde.

3,640,901
OXIDATIVE CONVERSION CATALYST
Darrell W. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Jan. 27, 1969, Ser. No. 794,372
Int. Cl. B01j *11/82*
U.S. Cl. 252—437 5 Claims

A catalyst for oxidative conversion comprising a tin oxide-phosphate complex in combination with a non-porous silica catalyst support having an average ultimate particle diameter of less than 1 micron, a surface area within the range of about 1 to 1500 square meters per gram and a density of less than about 0.2 gram per cubic centimeter, the complex being prepared by impregnating the carrier with stannous sulfate, drying, contacting the impregnated carrier with phosphoric acid and calcining.

3,640,902
CATALYST FOR THE VAPOR-PHASE OXIDATION OF LOWER OLEFINS AND A PROCESS FOR PREPARING THE SAME
Hiroo Ito, Seiichi Nakamura, and Hidemu Inoue, Minato-ku, Japan, assignors to Toa Gosei Chemical Industry Co., Ltd., Tokyo, Japan
No Drawing. Filed Sept. 10, 1968, Ser. No. 758,710
Claims priority, application Japan, Dec. 19, 1967, 42/80,940
Int. Cl. C07c *45/02*
U.S. Cl. 252—439 26 Claims

A catalyst for the vapor-phase oxidation of lower olefins is described and a process for preparing it by calcining the depositions from an aqueous solution of a water-soluble compound of tri-valent chrominum, a water-soluble compound of molybdenum, and a water-soluble compound of hexa-valent tellurium. Furthermore, the activity of the catalyst can be increased by the addition of cadmium, calcium, aluminum, cobalt, iron, or nickel. Special use is found in the oxidation of propylene to acrolein.

3,640,903
HYDROCARBON CONVERSION CATALYST AND METHOD OF MANUFACTURE
Lee Hilfman, Prospect Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Apr. 28, 1969, Ser. No. 819,932
Int. Cl. B01j *11/36, 11/40*
U.S. Cl. 252—451 9 Claims

A crystalline aluminosilicate is prepared dispersed in a silica matrix. The crystalline aluminosilicate-mother liquor slurry is admixed with an aqueous solution of a salt of a strong acid to precipitate substantially all of the residual alkali metal silicate contained therein as silica.

ERRATA

For Classes 252—455 and 252—456 see:
Patent Nos. 3,641,095 and 3,641,096

3,640,904
CATALYST COMPRISING LAYERED CRYSTALLINE CLAY-TYPE ALUMINOSILICATE COMPONENT, AND METHOD OF ACTIVATING SAID CATALYST
Sigmund M. Csicsery, Lafayette, Donald A. Hickson, Richmond, and Joseph Jaffe, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.
No Drawing. Filed Sept. 18, 1968, Ser. No. 760,676
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 R 4 Claims

A hydrocarbon conversion catalyst comprising a layered crystalline clay-type aluminosilicate component and a hydrogenating component, said hydrogenating component preferably being selected from rhenium and compounds thereof and Group VIII metals and compounds thereof, said catalyst having an activity as developed therein by heating said catalyst in an oxygen-containing gas stream at 900° to 1150° F. for 0.5 to 20 hours, and the method of activating a catalyst having the indicated composition which comprises heating in the indicated manner.

3,640,905
CLINOPTILOLITE BLENDS WITH SHAPE-SELECTIVE CATALYST
Robert C. Wilson, Jr., Woodbury, N.J., assignor to Mobil Oil Corporation
No Drawing. Filed Jan. 21, 1969, Ser. No. 792,827
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 Z 5 Claims

A method for the preparation of selective catalysts is disclosed which involves the blending of a crystalline aluminosilicate of the heulandite group with an aluminosilicate having an effective pore size of about 5 A. when the latter aluminosilicate is ion exchanged with cations to give it both an acidic function and a hydrogenation/dehydrogenation function. For reasons not completely understood, aluminosilicates of the heulandite group have a synergistic effect upon the 5 angstrom pore size aluminosilicate so that the resulting catalyst is more shape selective. Heulandite group aluminosilicates, i.e., heulandite, stilbite, epistilbite and clinoptilolite are bended with the 5 A. aluminosilicate in amounts ranging from about 20–80% by weight.

3,640,906
ELECTROCONDUCTIVE SINTERED GLASS
Gerald E. Wojcik, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed June 16, 1969, Ser. No. 833,593
Int. Cl. C03b *23/20;* C03c *15/00, 29/00*
U.S. Cl. 252—519 5 Claims

Novel, low expansion, electroconductive sintered glass article, suitable for making electronic components and the like.

3,640,907
SHAPED BODIES RESISTANT TO OXIDATION, PARTICULARLY ELECTRIC RESISTANCE ELEMENTS
Venanzio Bizzarri, Hallstahammar, Sweden, assignor to Aktiebolaget Kanthal, Hallstahammar, Sweden
No Drawing. Filed Feb. 27, 1969, Ser. No. 803,095
Int. Cl. C04b *35/50;* H01b *1/06*
U.S. Cl. 252—521 7 Claims

A dense shaped body which is resistant to oxidation and to temperatures in excess of 1700° C. is disclosed, consisting essentially of molybdenum silicide and having an oxide component of from about 1% to 12% based upon weight of the silicide, the oxide component containing about 1% to 10% thorium oxide by weight of the silicide, and a bonding means which is formed by sintering an alkali

clay of the montmorillonite group, the clay containing less than about 0.7% sodium by weight of the oxide component.

3,640,908

POLYMERIZATION OF EPOXIDES WITH DIHYDROCARBON ZINC PREREACTED WITH WATER

Edwin J. Vandenberg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Original application Mar. 31, 1960, Ser. No. 18,862, now Patent No. 3,536,634, dated Oct. 27, 1970. Divided and this application Mar. 25, 1970, Ser. No. 22,691

Int. Cl. C08g *23/06, 23/14*

U.S. Cl. 260—2 A 6 Claims

Oxiranes are polymerized using as the catalyst the product obtained by reacting a dihydrocarbon zinc compound, such as diethylzinc, with water in a molar ratio of water to zinc compound of from about 0.2:1 to about 1.2:1. Higher molecular weight polymers and/or higher yields of polymer are obtained than when the dihydrocarbon zinc compound is used without prereacting it with water.

3,640,909

SUBSTITUTED ACYLATED POLYIMINE RESINS

Giffin D. Jones, Midland, and Harold H. Roth, Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Feb. 17, 1969, Ser. No. 799,987

Int. Cl. C08g *33/08*

U.S. Cl. 260—2 BP 9 Claims

High molecular weight branched polyimine resins useful in paper manufacture are made by partially deacylating a linear N-acylated ethylenimine polymer by acid hydrolysis and reacting the product with a polyfunctional crosslinking agent such as an epihalohydrin or a diepoxide. Preferably, the acylated polymer is produced by polymerizing a 2-substituted oxazoline in the presence of a cationic catalyst.

3,640,910

ADVANCED ADDITION PRODUCTS CONTAINING TERMINAL EPOXIDE GROUPS

Daniel Porret, Binningen, Juergen Habermeier, Allschwil, and Hans Batzer, Arlesheim, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Apr. 2, 1969, Ser. No. 812,868

Claims priority, application Switzerland, Apr. 10, 1968, 5,379/68; Aug. 2, 1968, 11,638/68

Int. Cl. C08g *30/00*

U.S. Cl. 260—2 EP 23 Claims

New, so-called "advanced" adducts containing epoxide groups, from polyepoxide compounds containing on an average more than one epoxide group in the molecule and mononuclear, five- or six-membered, unsubstituted or substituted N-heterocyclic compounds whose molecule contains two endocyclic NH groups, and less than one equivalent NH group for every epoxide group equivalent of the polyepoxide compound, obtained by reaction of for example 2 mols of diomethanediglycidyl ether and 1 mol of 5,5-dimethylhydantoin. The epoxide resins "advanced" with the aid of such nitrogen compounds have a good storage stability in addition to excellent electrical properties.

3,640,911

PHENOLIC FOAM PROCESS

Anthony Joseph Papa, St. Albans, and William Robert Proops, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Apr. 4, 1969, Ser. No. 813,726

Int. Cl. C08g *53/10*

U.S. Cl. 260—2.5 F 13 Claims

Phenolic foams are produced containing a minor amount of an olefin epoxide as a catalyst promoter. The epoxides contain an oxirane group and are free of etheric oxygen. Illustrative thereof are isobutylene oxide, vinylcyclohexene dioxide, glycidol or 3,4-epoxycyclohexylmethyl 3,4-epoxycyclohexanecarboxylate.

3,640,912

MOLDING MATERIALS BASED ON ELASTOMERIC POLYMERS AND ORGANIC BINDERS WITH OR WITHOUT MINERAL FILLERS

Hans Reinhard, Limburgerhof, Rolf Petri, Frankenthal, and Wilhelm-Friedrich Beckerle, Worms, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Mar. 12, 1969, Ser. No. 806,677

Claims priority, application Germany, Mar. 16, 1968, P 17 20 063.4

Int. Cl. C08d *9/04, 13/38*

U.S. Cl. 260—2.3 14 Claims

Molding materials based on 20 to 90% of elastomeric polymers, 5 to 30% of binder copolymers prepared from 20 to 80% of butadiene, 80 to 20% of styrene and/or acrylonitrile and 0 to 20% of other monomers and finely dispersed in water, 5 to 200% (with reference to the binder copolymers) of cement and/or slaked lime, 0.5 to 10% of air-drying oil and 0 to 50% of mineral fillers are particularly suitable for the production of playground and sportsground surfacings which are easy to look after.

3,640,913

PROCESS FOR HEATING POLYMERS WITH DIELECTRIC HEATING

Peter A. Cerra, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Apr. 17, 1969, Ser. No. 817,203

Int. Cl. C08f *47/10*

U.S. Cl. 260—2.5 R 8 Claims

Polymers are rapidly heated by an improved process wherein (1) a composition containing an organic polymer is blended with a zinc halide and (2) the resultant blend is heated by applying to it a high frequency alternating electric field. The improved process is particularly useful in preparing foamed polymers wherein a conventional blowing agent is incorporated into a blend of organic polymer and zinc halide and the blend is then dielectrically heated.

3,640,914

FLAME-RESISTANT FOAMED RESIN COMPOSITION

Masao Ogawa, Tokyo, Teruyuki Enjoji, Oita-ken, and Humio Arai, Kanagawa-ken, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Mar. 11, 1969, Ser. No. 806,286

Int. Cl. C08f *29/22, 47/10*

U.S. Cl. 260—2.5 FP 5 Claims

A foamed resin composition of a high flame resistance, which comprises a three-component resin of acrylonitrile/chlorinated polyethylene/styrene, and a small amount of diantimony trioxide.

3,640,915

PRODUCTION OF FOAMED POLYETHYLENE

Alfred Cooper, Sanderstead, England, assignor to Expanded Rubber & Plastics Ltd., Croydon, England

Continuation-in-part of application Ser. No. 476,679, Aug. 2, 1965. This application Oct. 17, 1968, Ser. No. 768,521

Int. Cl. C08f *27/00, 29/04, 47/10*

U.S. Cl. 260—2.5 R 10 Claims

The present invention relates to a process for producing expanded polyethylene having a density of from 1 to 5

lbs./ft.^{3} comprising raising the melting point of ethylene polymer by subjecting the polymer to a cross-linking treatment equivalent to that produced by an irradiation dose of between 2 and 6 megarads and thereafter heating the cross-linked polymer to a temperature above the softening temperature in atmosphere of nitrogen at a pressure of 2,000 to 12,000 lbs. per square inch to impregnate the polymer with nitrogen and expanding the nitrogen-impregnated polymer by releasing the pressure thereon.

3,640,916
FOAM PRODUCING COMPOSITIONS
Douglas W. Dill, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
No Drawing. Filed Dec. 16, 1968, Ser. No. 784,205
Int. Cl. C08f *15/40, 47/10, 47/16*
U.S. Cl. 260—2.5 L 11 Claims

The disclosure relates to compositions and processes for forming cellular structures. The compositions comprise an emulsion of a synthetic organic polymer having a minimum film-forming temperature of less than about 25° C. and, dispersed in the emulsion, a volatile organic liquid which has a vapor pressure of at least about 2 p.s.i.a. at about 20° C.

3,640,917
CELLULAR PLASTICS OF EPOXY RESINS AND PROCESS FOR THEIR MANUFACTURE
Ernst Nölken, Frankfurt am Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Jan. 23, 1969, Ser. No. 793,593
Claims priority, application Germany, Jan. 25, 1968, P 17 20 776.0
Int. Cl. C08g *53/10*
U.S. Cl. 260—2.5 10 Claims

A process for foaming and hardening an epoxy resin or mixtures thereof with a lactone or a cyclic ether under the action of inert readily volatile organic solvents as foaming agents and fluophosphoric acid or mixtures of fluophosphoric acid with other phosphorus compounds as hardeners.

3,640,918
PROCESS FOR THE MANUFACTURE OF FOAM MATERIALS CONTAINING PLASTICIZERS AND MADE OF POLYVINYL CHLORIDE AND COPOLYMERS OF VINYL CHLORIDE
Otto Fuchs, Oberlar, uber Troisdorf, Germany, assignor to Dynamit Nobel AG, Troisdorf, Germany
No Drawing. Filed Apr. 7, 1969, Ser. No. 815,263
Claims priority, application Germany, Apr. 8, 1968, P 17 69 127.9
Int. Cl. C08f *45/40, 47/08*
U.S. Cl. 260—2.5 P 9 Claims

Improvements in forming plasticized vinyl chloride polymer foams by admixing vinyl chloride polymer plastisols with a substantially moisture-free wetting or dispersing agent at least partially dissolved in a fatty alcohol and then foaming such admixture with a substantially inert gas.

3,640,919
FOAMED POLY-1-BUTENE
Alfred Michels, Marl, and Josef Bittscheidt, Datteln, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany
Filed May 12, 1969, Ser. No. 823,541
Claims priority, application Germany, May 30, 1968, P 17 69 486.9
Int. Cl. C08f *29/02, 47/10*
U.S. Cl. 260—2.5 HA 4 Claims

An improvement in the process of a foaming poly-1-butene by mixing it with a nitrogen liberating foaming agent, an organic peroxide with a decomposition temperature of at least 170° C., elementary sulfur and an organic compound containing a plurality of allyl groups.

3,640,920
RIGID, LOW-DENSITY, FILLED CELLULAR POLYURETHANES
Stanley Cear, Wilmington, Del., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.
No Drawing. Filed May 21, 1969, Ser. No. 826,726
Int. Cl. C08g *22/44, 51/04*
U.S. Cl. 260—2.5 AK 9 Claims

Rigid, low density polyurethane foam compositions are provided which have excellent freezer stability while retaining the insulative value, compression strength and other desirable physical properties characteristic of rigid polyurethane foams. The polyurethane foams contain from about 0.05% to about 0.5% by weight of a finely divided, solid, particulate, insoluble and non-reactive additive material such as is commonly used in foams as filler material.

3,640,921
FILAMENTARY POLYOLEFIN FOAM PRODUCT AND PROCESS OF MAKING THE SAME
Hans Eberle, Limburgerhof, and Gerhard Wuttke, Neuhofen, Germany, assignors to Grunzweig & Hartmann Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Continuation-in-part of application Ser. No. 793,914, Jan. 24, 1969. This application Aug. 1, 1969, Ser. No. 847,536
Claims priority, application Germany, Jan. 27, 1968, P 16 94 357.0; Aug. 3, 1968, P 17 69 909.1
Int. Cl. C08f *29/12, 47/10;* B29d *27/00*
U.S. Cl. 260—2.5 E 18 Claims

A filamentary product consists of a foamed polypropylene comprising (a) a major portion of a stereoregular propylene polymerizate having a relatively high molecular weight and (b) a minor portion of a heptane-soluble polymerizate of relatively low molecular weight.

The product is made by foaming and extruding a mixture of propylene polymers having a molecular weight above 600,000 and a liquid hydrocarbon having from 5 to 10 carbon atoms at a temperature between 170 and 220° C. whereupon the extruded body is immediately subjected to stretching without intermediate heating or compressing.

3,640,922
STABLE AQUEOUS DISPERSIONS
David P. Sheetz, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Apr. 3, 1969, Ser. No. 813,333
Int. Cl. C08d *7/18;* C08f *47/16*
U.S. Cl. 260—4 R 16 Claims

Aqueous colloidal dispersions having improved stability are prepared by adsorbing a polymerizable surfactant, such as sodium allyl α-sulfopalmitate, on the surface of particles dispersed in aqueous media, such as in a preformed latex, and polymerizing in place the adsorbed surfactant. Ordinarily an amount of polymerizable surfactant to provide from about 50 percent to about 100 percent coverage of the particles is used.

3,640,923
POLYENES CURED WITH POLYTHIOLS WITH IRON COMPOUNDS AND OXIME ESTERS AS ACCELERATORS
James L. Guthrie, Ashton, Md., assignor to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,198
Int. Cl. C08b *21/08;* C08f *27/06*
U.S. Cl. 260—13 22 Claims

This invention relates to accelerated curing under ambient conditions of a liquid composition comprising a

polyene containing at least two reactive unsaturated carbon to carbon bonds per molecule and a polythiol containing at least two thiol groups per molecule, the total combined functionality of (a) the reactive unsaturated carbon to carbon bonds per molecule in the polyene and (b) the thiol groups per molecule in the polythiol being greater than four, in the presence of a curing rate accelerator comprising a catalytic amount of iron and its compounds. The addition of a minor amount of an oxime ester to the system allows one to cure in an inert atmosphere. The polythioethers formed can be used as adhesives.

3,640,924

TEXTILE ADHESIVE FROM POLYURETHANE CONTAINING CARBOXYLATE GROUPS

David Trimble Hermann, Flemington, and Kenneth Herald Remley, Warren Township, Somerset County, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Dec. 20, 1968, Ser. No. 785,779
Int. Cl. C08g *22/16, 41/00*
U.S. Cl. 260—13 3 Claims

Aqueous adhesive compositions containing a dispersed polyurethane polymer, the method of using the adhesive composition in textile applications, and the textile materials thus obtained.

The adhesive composition is an aqueous dispersion of a particular class of self-dispersible or emulsifiable polyurethane polymers. The aqueous dispersions are obtained by adding a particular class of isocyanate-terminated polyurethane prepolymers having pendant carboxyl groups to water containing a tertiary aliphatic amine and allowing chain extension with water to proceed until all of the isocyanate groups have been reacted. The resulting polyurethane latex is thickened to the desirable viscosity with suitable thickening agents.

3,640,925

PROCESS FOR THE SIMULTANEOUS GELATINIZATION AND GRAFT COPOLYMERIZATION OF MONOMERS ONTO STARCH

Gerald F. Touzinsky, Laurel, and Hans W. Maurer, Ellicott City, Md., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 16, 1969, Ser. No. 866,880
Int. Cl. C08f *25/00*
U.S. Cl. 260—17.4 GC 16 Claims

Process for simultaneously gelatinizing starch and initiating graft copolymerization between a polymerizable ethylenically unsaturated monomer and starch which includes forming an aqueous dispersion of starch, monomer, and a peroxidic free-radical initiator, and heating the dispersion to substantially instantaneously gelatinize the starch and initiate a graft copolymerization reaction between the monomer and starch.

3,640,926

AQUEOUS DISPERSIONS OF EPOXY RESIN ESTERS AND METHOD OF PREPARING SAME

William W. Slater, Little Silver, N.J., and Lawrence E. Thow, Louisville, Ky., assignors to Celanese Coatings Company, New York, N.Y.

No Drawing. Original application Mar. 19, 1965, Ser. No. 441,365, now Patent No. 3,468,779. Divided and this application Apr. 16, 1969, Ser. No. 818,468
Int. Cl. C08g *53/18*
U.S. Cl. 260—18 EP 8 Claims

An aqueous dispersion of a coating-forming epoxy resin ester and a salted amine, suitable for use in electro-coating, said salted amine being the reaction product of a carboxylic acid having 1 to 8 carbon atoms and a tertiary amine in which the fatty carbon chain has from 12 to 24 carbon atoms.

3,640,927

POLYMERIZATION PRODUCTS OF VINYL MONOMERS AND ACRYLATE OR VINYL ESTER TERMINATED POLYESTERS

Carl S. Marvel and Roberta C. L. Chow, Tucson, Ariz., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Jan. 22, 1969, Ser. No. 793,189
Int. Cl. C08f *15/26, 15/28, 21/04*
U.S. Cl. 260—23 CP 12 Claims

There are disclosed herein addition copolymers of (a) a vinyl monomer and (b) a polymerizable polyester, for example, an acrylate or a vinyl ester of a polyester of an aliphatic hydroxycarboxylic acid. A typical example is the copolymer of (a) vinyl chloride and (b) a vinyl ester of a polyester of 10-hydroxydecanoic acid. This copolymer is useful for preparing flexible films.

3,640,928

STABILIZATION OF SYNTHETIC POLYMERS

Keisuke Murayama, Syoji Morimura, Takao Yoshioka, Katsuaki Matsui, Tomoyuki Kurumada, Ichiro Watanabe, and Noriyuki Ohta, Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

No Drawing. Filed June 5, 1969, Ser. No. 830,842
Claims priority, application Japan, June 12, 1968, 43/40,377; Mar. 8, 1969, 44/17,841
Int. Cl. C08f *45/60, 51/60*
U.S. Cl. 260—23 XA 8 Claims

This invention discloses the stabilization of synthetic polymers including a polyolefin, a polyvinyl chloride, a polyvinylidene chloride, a polyurethane and a polyamide against photo- and thermo-deteriorations thereof by incorporating therein a piperidine derivative in a sufficient amount to prevent such deteriorations thereof, usually in an amount of 0.01 to 5.0% by weight based on the amount of the synthetic polymer.

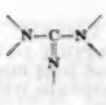
3,640,929

CHRYSOTILE ASBESTOS FIBER REINFORCED POLYMERS OF PROPYLENE

Thomas W. Darling, Rochdale, England, assignor to Turner Brothers Asbestos Company Limited, Manchester, England

No Drawing. Filed Oct. 10, 1968, Ser. No. 766,621
Claims priority, application Great Britain, Oct. 12, 1967, 46,668/67
Int. Cl. C08f *29/02, 45/60*
U.S. Cl. 260—23 H 8 Claims

Polypropylene or copolymers of propylene reinforced with chrysotile asbestos and containing an antioxidant system comprising one or more compounds containing the group



and a phenolic compound show greatly improved oxidation resistance. Oxidation resistance may be further increased by the addition of certain sulphur compounds, and by suitable pretreatment of the asbestos fiber prior to compounding.

3,640,930
PRODUCTION OF POLYVINYL CHLORIDE SHAPED ARTICLES
Robert Buning, Oberlar, and Hans Raalf and Wolfgang Pungs, Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Bezirk-Cologne, Germany
No Drawing. Continuation of application Ser. No. 544,114, Apr. 21, 1966. This application Sept. 23, 1968, Ser. No. 772,445
Claims priority, application Germany, Apr. 24, 1965, D 47,108
Int. Cl. C08f *21/04, 29/18*
U.S. Cl. 260—23 XA 2 Claims

A shaped article of post-chlorinated eutactic polyvinyl chloride which may or may not be admixed with a suitable plasticizer.

3,640,931
CROSS-LINKABLE DERIVATIVES OF AN ADDITION POLYMER IN A SUBSTANTIALLY NON-POLAR ORGANIC LIQUID
Michael Raymond Clarke, Frankston, Victoria, and Leon Filipowicz, East St. Kilda, Victoria, Australia, assignors to Balm Paints Limited, Melbourne, Victoria, Australia
No Drawing. Filed Oct. 15, 1968, Ser. No. 767,825
Claims priority, application Australia, Oct. 27, 1967, 29,086/67
Int. Cl. C08f *47/18*
U.S. Cl. 260—23 EM 14 Claims

A process of preparing a stable dispersion of a cross-linkable derivative of an addition polymer in a substantially non-polar organic liquid. A dispersion of a suitably chemically reactive addition polymer is first prepared in the liquid and then an unsaturated derivative formed. The derivative is cross-linkable by an autoxidative or free radical initiated mechanism or both.

3,640,932
COMPOSITIONS FOR SAND CORE MOLD ELEMENTS
Joel M. Schnur, Agawam, Mass., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Oct. 21, 1968, Ser. No. 769,384
Int. Cl. C08g *51/04, 51/24*
U.S. Cl. 260—29.3 10 Claims

Foundry sand core mold elements having improved structural characteristics are made by compositing sand with a water soluble sulfonated resole resin composition.

3,640,933
PREPARATION OF POLYACROLEIN-SODIUM BISULFITE ADDUCT
George T. Kekish, Chicago, William G. James, Joliet, and Duane J. Simons, Chicago, Ill., assignors to Nalco Chemical Company, Chicago, Ill.
No Drawing. Filed Mar. 20, 1969, Ser. No. 809,026
Int. Cl. C08f *45/24*
U.S. Cl. 260—29.6 R 7 Claims

In the process of producing an aqueous bisulfite adduct useful as a paper mill additive from a wet cake of polyacrolein containing about 40–50% solids, water and at least one C_5–C_8 alkane as a non-solvent diluent produced by homopolymerizing the acrolein monomer by an invert emulsion technique, the improvements consisting in forming a reaction mix utilizing a bisulfite reactant in a weight ratio of about 1.5–2.5 parts per part of polyacrolein based upon theoretical monomer, stripping the C_5–C_8 alkane diluent from the reaction mix by azeotropic vacuum distillation for a short time period and subsequently heating and reacting the polyacrolein and bisulfite for about 1–3 hours at 195–205° F. at atmospheric pressure and at an acid pH of 3.5–4.5 to produce an aqueous polyacrolein-bisulfite adduct and terminally heating the reaction mix by vacuum distillation for a short period of time to remove residium C_5–C_8 alkane diluent and SO_2 and adjusting the water content so that the now dissolved polyacrolein (PAC) bisulfite adduct solids equal about 35% of the total.

3,640,934
2-PYRROLIDONYL POLYACROLEIN BISULFITE
Nathan D. Field, Allentown, and David I. Randall, Easton, Pa., and Jimmie D. Fitzpatrick, Lafayette, La., assignors to GAF Corporation, New York, N.Y.
No Drawing. Filed Feb. 13, 1969, Ser. No. 799,108
Int. Cl. C08g *9/28*
U.S. Cl. 260—29.4 U 4 Claims

A new composition of matter comprising 2-pyrrolidonyl polyacrolein bisulfite.

3,640,935
METHOD FOR STABILIZING LATICES
Murray S. Abriss, 503 Maple Hill Road, Havertown, Pa. 19083
No Drawing. Continuation-in-part of application Ser. No. 575,253, Aug. 26, 1966. This application Mar. 12, 1969, Ser. No. 806,685
Int. Cl. C08f *37/00*
U.S. Cl. 260—29.6 TA 6 Claims

The method of improving the stability of a vinyl polymer latex by adding to the latex a non-ionic surface active agent in the form of a solution in a water-soluble glycol.

3,640,936
WET STRENGTH RESINS
Laurence Lyman Williams, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed May 5, 1969, Ser. No. 821,949
Int. Cl. C08f *27/14, 29/00*
U.S. Cl. 260—29.6 HN 7 Claims

A water-soluble thermosetting polymer of high cationic density and a decreased number of ethylene cross-linkages is prepared by reacting polyacrylonitrile with ethylenediamine to form polyvinylimidazoline, hydrating the polyvinylimidazoline, and reacting the hydration product with epichlorohydrin.

The polymer at low molecular weight is a wet-strength resin for paper and at high molecular weight is a flocculating agent for solids suspended in water and a drainage aid in the manufacture of paper.

3,640,937
LINEAR, SEGMENTED POLYURETHANE ELASTOMERS
Wilhelm Thoma, Bergisch Neukirchen, Harald Oertel, Odenthal-Gloebusch, Heinrich Rinke, Leverkusen-Schlebusch, and Ulrich Bahr, Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed June 3, 1969, Ser. No. 830,128
Claims priority, application Germany, June 7, 1968, P 17 70 591.8
Int. Cl. C08g *22/04, 51/44*; C07c *133/02*
U.S. Cl. 260—30.8 16 Claims

This invention relates to highly elastic linear segmented polyurethanes comprising segments obtained from certain semi-carbazide hydrazides chain extending agents, highly elastic fibres thereof and to a process for the preparation of said linear, segmented polyurethane elastomers.

3,640,938
POLYURETHANE COMPOSITION AND ITS USE TO FORM POLYSTYRENE LAMINATES
Anthony F. Finelli, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Filed Jan. 31, 1969, Ser. No. 795,692
Int. Cl. C08g *22/04*
U.S. Cl. 260—32.8 N 3 Claims

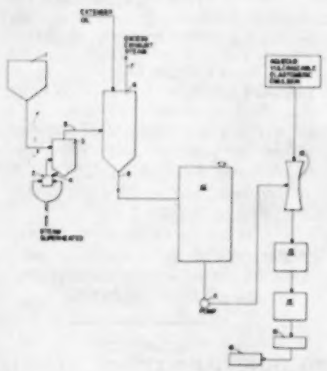
This invention relates to polyurethane compositions and to a method of applying polyurethane coatings to poly-

styrene to produce laminates. The polyurethane compositions are the reaction product of a reactive hydrogen containing material of 400 to about 12,000 molecular weight, an organic polyisocyanate and a curative which has been dispersed in a solvent which does not affect the surface of the polystyrene, the solvent being diacetone alcohol.

3,640,939
STABILIZED HIGHLY AROMATIC OIL MASTERBATCHES OF COUPLED SOLUTION POLYMERS
Antonio A. Geraldo, Borger, Tex., assignor to Phillips Petroleum Company
No Drawing. Filed Mar. 7, 1969, Ser. No. 805,356
Int. Cl. C08f *45/52*
U.S. Cl. 260—33.6 **13 Claims**

Mooney viscosity stability of highly aromatic oil extended masterbatches of coupled solution polymerized polymers is improved.

3,640,940
USING GROUND CARBON IN OIL PHASE MASTERBATCHING
William W. Gotshall, 3081 Walma Drive, Orchard Lake, Mich. 48034
Filed Mar. 25, 1970, Ser. No. 22,646
Int. Cl. C08c *11/18, 11/22*; C08d *7/04*
U.S. Cl. 260—33.6 AQ **7 Claims**



Ground carbons from coke or coal ground in non-oxidizing atmosphere and coated with oil can be dispersed and protected from oxidation by mixing them directly into oil phase masterbatches.

3,640,941
ADHESIVE COMPOSITION
Harold J. Findley and James L. Meier, Eaton, Ohio, assignors to Whittaker Corporation
No Drawing. Filed May 8, 1970, Ser. No. 35,915
Int. Cl. C08f *45/28, 45/30*
U.S. Cl. 260—33.6 A **17 Claims**

An adhesive composition which is particularly useful for bonding vulcanizable rubber to metal surfaces comprises (a) a graft polymer formed from the combination of polybutadiene or halogenated polybutadiene and substituted cyclopentadiene monomer, (b) dibasic lead phosphite, (c) resorcinol, and (d) a volatile organic solvent for the graft polymer. The polybutadiene and substituted cyclopentadiene reactants are reacted at an elevated temperature between about 110° C. and about 165° C. until substantially all of the substituted cyclopentadiene is grafted onto the polybutadiene.

After this adhesive composition is coated on a metal surface, vulcanizable rubber is placed in contact with the coated metal surface and the resulting structure is cured.

3,640,942
MANUFACTURE OF DELUSTRED NYLON FILAMENTS
Edward Crampsey, Chaddesden, Derby, England, assignor to Courtaulds Limited, London, England
No Drawing. Filed May 2, 1969, Ser. No. 821,464
Claims priority, application Great Britain, May 24, 1968, 24,831/68
Int. Cl. C08g *41/04, 51/04*
U.S. Cl. 260—37 N **5 Claims**

Polyamide filaments which are both delustred and resistant to acid dyes, comprising an intimate blend of a substituted co-polyamide having covalently bound anionic sulphonate groups and a polyamide, in which is dispersed titanium dioxide particles.

3,640,943
POLYMER-FILLER COMPOSITION
Edgar E. Bostick and George L. Gaines, Jr., Scotia, and Donald G. Le Grand, Burnt Hills, N.Y., assignors to General Electric Company
No Drawing. Filed July 7, 1969, Ser. No. 839,616
Int. Cl. C08g *51/04*
U.S. Cl. 260—375 B **21 Claims**

A polymer-filler composition having improved properties comprised of a base polymer, a filler and a surface-active additive which is a block copolymer. The block copolymer additive contains at least two polymerized comonomers, one of which is compatible with the base polymer thereby imparting stability to the composition, and the second of which is surface-active in the composition so that the block copolymer is concentrated at the interface between the filler and base polymer to provide a bond therebetween.

3,640,944
MODIFIED POLYESTER FILM FOR PUNCHED TAPES
Harold J. Seppala, Woodbury Township, Washington County, and Gerhard Benz, Cottage Grove Township, Washington County, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Filed Jan. 31, 1969, Ser. No. 795,741
Int. Cl. C08g *51/04*
U.S. Cl. 260—40 **11 Claims**

A durable, relatively non-abrasive film having utility as a program tape is prepared by physically blending major amounts of polyethylene terephthalate with minor effective amounts of high melting polymers such as polysulfone or poly (4-methyl, 1-pentene) and a light absorbing material, extruding the blend as a film and thereafter biaxially orienting it. The film allows as little as 1% light transmission and has a surface which can be written on with pencil or pen.

3,640,945
THERMAL STABILITY OF COPOLYMERS OF TRIOXANE
Ernst Ricker, Frankenthal, and Franz Schmidt and Erich Schwartz, Mannheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed Oct. 1, 1968, Ser. No. 764,335
Claims priority, application Germany, Oct. 10, 1967, P 17 20 309.7, P 17 20 311.1
The portion of the term of the patent subsequent to Nov. 1, 1983, has been disclaimed
Int. Cl. C08g *1/22*
U.S. Cl. 260—45.7 **10 Claims**

A process for improving the thermal stability of copolymers of trioxane which contain at least 80% by

weight of —O—CH_3— groups and distributed in the polymer chain in amounts of less than 20% by weight (with reference to the copolymer) of

groupings by eliminating unstable portions of the chain by heating with aqueous solutions of alkali metal or alkaline earth metal fluorides.

3,640,946

FLAME RETARDANT POLYMERS OF PROPYLENE

James C. W. Chien and Robert J. Schwarz, Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Apr. 29, 1969, Ser. No. 820,330

Int. Cl. C08f *45/04*

U.S. Cl. 260—41 B **4 Claims**

Flame retardant compositions of polymers of propylene are described. The polymers are rendered flame retardant by addition of 4–10% of a chlorinated polyisobutylene and 0 to 5% of antimony trioxide, the amount of the chlorinated polyisobutylene and antimony trioxide together being 5–15% by weight of the composition.

3,640,947

NON-TOXIC STABILIZED POLYVINYL CHLORIDE PRODUCTS AND STABILIZER COMPOSITIONS

Carl Robert Gloskey, Sterling, N.J., assignor to M & T Chemicals Inc., New York, N.Y.

No Drawing. Continuation of application Ser. No. 694,829, Jan. 2, 1968. This application June 25, 1970, Ser. No. 49,961

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 K **11 Claims**

The present invention provides a novel non-toxic organotin stabilizer composition containing about 95 percent of di(n - octyl)-Sn, S,S' - bis(isooctylmercaptoacetate). The stabilizer composition also contains specified amounts of other organic tin compounds. The invention also provides non-toxic polyvinyl chloride containing resins suitable for food packaging use.

3,640,948

STABILIZED POLYAMIDES

John Ernest Jackson, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Apr. 23, 1969, Ser. No. 818,787

Claims priority, application Great Britain, May 14, 1968, 22,886/68

Int. Cl. C08g *51/56, 51/62*

U.S. Cl. 260—45.75 R **9 Claims**

A high molecular weight fiber-forming stabilized polyamide contains 5–100 p.p.m. by weight on the polyamide of phosphorus in the form of a phosphorous acid or a salt thereof and 100–10,000 p.p.m. by weight on the polyamide of a sulfur-containing phenol having the formula OH—ϕ—S—R where ϕ represents a benzene ring. The hydroxyl group is positioned para or ortho to the sulfur atom and R is alkyl, aryl and preferably an identical ϕ—OH structure as above, located symmetrically about the sulfur atom.

3,640,949

PRODUCTION OF FLAME RETARDANT POLYPROPYLENE COMPOSITIONS

Darwin Allen Dalzell, Alma, Mich., assignor to Michigan Chemical Corporation, St. Louis, Mich.

No Drawing. Filed Apr. 29, 1969, Ser. No. 820,286

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.75 R **8 Claims**

Polypropylene is rendered flame retardant without impairing its physical properties by incorporating in it an additive comprised of tetrabromophthalic anhydride, a fumed silica, and antimony trioxide or an equivalent antimony compound.

3,640,950

HALOGENATED RESINS STABILIZED WITH NOVEL COMPOSITIONS

Lewis B. Weisfeld, Highland Park, N.J., assignor to Cincinnati Milacron Chemicals Inc., Reading, Ohio

No Drawing. Continuation-in-part of application Ser. No. 577,844, Sept. 8, 1966. This application Feb. 27, 1969, Ser. No. 803,084

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 K **13 Claims**

The early color stability of halogenated resins stabilized with diorganotin mercapto compounds is improved by including a minor amount of monohydrocarbyltin derivatives therewith. This combination also frequently reduces processing and finish odors associated with mercapto stabilizers.

3,640,951

STABILIZED POLYCARBONATES

Herbert L. Rawlings, New Martinsville, W. Va., assignor to Baychem Corporation, New York, N.Y.

No Drawing. Filed Aug. 30, 1968, Ser. No. 756,415

Int. Cl. C08g *51/60*

U.S. Cl. 260—45.8 **7 Claims**

Polycarbonates stabilized against thermal degradation with a stabilizing amount of 2-(stilbyl-4")-(4,5-arylo)-1,2,3,-triazole.

3,640,952

POLYESTERURETHANES STABILIZED WITH IMINO-OXAZINES

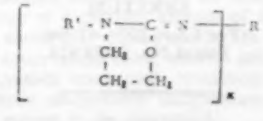
Sidney H. Metzger, Jr., Leverkusen-Neuenhof, Germany, assignor to Mobay Chemical Company, Pittsburgh, Pa.

No Drawing. Original application Mar. 2, 1966, Ser. No. 531,093, now Patent No. 3,479,351, dated Nov. 18, 1969. Divided and this application June 11, 1969, Ser. No. 832,421

Int. Cl. C08g *51/60*

U.S. Cl. 260—45.8 NZ **6 Claims**

Polyester based polymeric compositions are stabilized against hydrolysis by adding to said polyester based polymeric compositions a stabilizing amount of a tetrahydro-1,3-oxazine. The preferred tetrahydro-1,3-oxazines have the formula



wherein R and R' are selected from the group consisting of aliphatic, cycloaliphatic or aromatic radicals and x is 1 or 2.

3,640,953

STABILIZATION OF POLYVINYL CHLORIDE RESINS

Lawrence R. Brecker, Brooklyn, and Alfred Thee, Long Beach, N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Jan. 23, 1969, Ser. No. 793,503

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 K **24 Claims**

A polyvinyl chloride resin stabilizer combination having a readily controlled tin content is provided which lessens the development of early discoloration of the resin when heated at elevated temperatures, for example, 350° F., comprising a diorganotin mercaptocarboxylic acid ester and a diorganotin oxide-ester complex which

is a reaction product of a diorganotin oxide and an ester of an oxygen-containing acid. The above stabilizer components can be liquids or solids. However, where the stabilizer components are liquid, a homogeneous stable liquid mixture is formed.

Polyvinyl chloride resin compositions and a process for stabilizing such resins are also provided, using the above stabilizer combination, the resins having as a result increased resistance to the development of early discoloration when heated at elevated temperatures.

A process also is provided for preparing organotin stabilizer compositions having a low to high tin content controllable over a wide range without limitations due to stoichiometric considerations.

3,640,954

TREATMENT OF POLYVINYL HALIDES

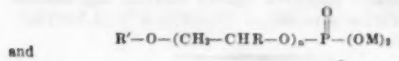
Paul Kraft, Spring Valley, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 657,006, July 31, 1967. This application June 5, 1969, Ser. No. 830,872

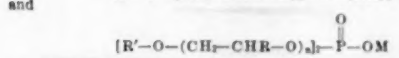
Int. Cl. C08f *1/11, 1/13, 1/88*

U.S. Cl. 260—45.95 **5 Claims**

Polyvinyl halides, particularly PVC, are made resistant to thermal degradation and plasticizer absorption by treating the latices with relatively polar, water-dispersible or water-soluble organo phosphates of the general formulae



and



in which M is a metal cation or ammonium and particularly an alkali metal, *n* is an integer from 1 to 30, R is hydrogen or lower alkyl of 1 to 2 carbons, and R′ is alkyl or alkyl-substituted phenyl wherein the alkyl groups contain about 1 to 20 carbons. Preferably R′ is either a straight chain alkyl group or a tertiary alkyl-substituted phenyl group wherein the alkyls total about 1 to 12 carbons. The polymers thus treated are especially useful in plastisols. Addition of the phosphate is made during or after the occurrence of the pressure drop in the polymerization of the polyvinyl chloride polymer.

ERRATUM

For Class 260—47 see:
Patent No. 3,639,928

3,640,955

LINEAR POLYURETHANE OF DI- OR TRI-NUCLEAR N,N′-DIALKYLDIAMINES AND DI- OR TRI-NUCLEAR DIHYDROXYL COMPOUNDS

Heinrich Krimm, Krefeld-Bochum, Hermann Schnell, Krefeld-Urdingen, and Gunther Lenz, Krefeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation-in-part of applications Ser. No. 752,136, Aug. 13, 1968, and Ser. No. 780,895, Dec. 3, 1968. This application July 22, 1970, Ser. No. 57,309

Claims priority, application Germany, Aug. 26, 1967, F 53,340; Dec. 8, 1967, F 54,265

Int. Cl. C08g *22/26*

U.S. Cl. 260—47 CZ **3 Claims**

High molecular weight polyurethanes having excellent thermal stability based on condensing di- or trinuclear N,N′-dialkyldiamines in which the nitrogen is aromatically linked with di- or tri-nuclear dihydroxyl compounds and bifunctional carbonic acid derivatives, or by condensing bis-monocarbonic acid derivatives of di- or tri-nuclear N,N′-dialkyldiamines with di- or tri-nuclear aromatic dihydroxyl compounds or by condensing bis-monocarbonic acid derivatives of di- or tri-nuclear aromatic dihydroxyl compounds with di- or tri-nuclear N,N′-dialkyldiamines.

3,640,956

POLYBENZIMIDAZOLECARBOXAMIDES AND PROCESS

James Guilbert Colson, Williamsville, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,072

Int. Cl. C08g *20/32*

U.S. Cl. 260—47 CP **5 Claims**

Polybenzimidazolecarboxamide polymers are provided; these are prepared by treating a polymer containing imidazopyrrolone ring systems with ammonia; the polymers are useful as adhesives, especially for high temperature applications.

3,640,957

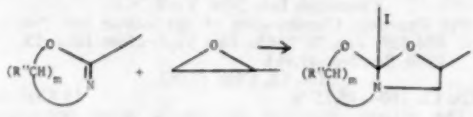
MONOOXAZOLINE AND OXAZINE CURED EPOXY RESINS

Donald A. Tomalia and Robert J. Thomas, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed June 16, 1969, Ser. No. 833,663

Int. Cl. C08g *30/14*

U.S. Cl. 260—47 EN **4 Claims**



wherein R″ is hydrogen or loweralkyl C_{1-4}, *m* is 2 or 3, and each heterocycle is part of an entire molecule. It is a highly effective curing agent, by both reaction and catalysis, for polyepoxides to obtain epoxy resins.

3,640,958

PHENOLIC RESIN COMPOSITIONS MODIFIED WITH GROUP II METAL HYDROXIDES OR OXIDES AND A CAPROLACTONE

Anthony C. Soldatos, Kendall Park, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No drawing. Filed Apr. 1, 1969, Ser. No. 812,344

Int. Cl. C08g *5/18*

U.S. Cl. 260—59 **16 Claims**

This invention relates to phenolic resin compositions modified with Group II metal hydroxides or oxides and an ε-caprolactone, which are characterized by relatively low viscosity and can be molded into shaped articles of desired configuration having excellent chemical and physical properties.

3,640,959

CURED POLYFERROCENYLENES AND PROCESS FOR CURING

Norman Bilow, Los Angeles, Calif., and Harold Rosenberg, Dayton, Ohio, assignors to the United States of America as represented by the Secretary of the Air Force

No Drawing. Filed Mar. 6, 1969, Ser. No. 805,008

Int. Cl. C08g *3/00, 13/00*

U.S. Cl. 260—64 **11 Claims**

Cured polyferrocenylenes and the process for curing them are disclosed. Low molecular weight thermoplastic polyferrocenylenes are reacted with aromatic dicarboxaldehydes. The resulting copolymers cross-link and cure to hard, heat-resistant, radiation-resistant structures upon treatment with heat and pressure.

3,640,960

STABILIZED POLYIMIDAZOPYRROLONES COMPOSITIONS AND METHOD OF PREPARATION

George M. Bower, 2301 Sonny St., Pittsburgh, Pa. 15221

No Drawing. Filed May 27, 1969, Ser. No. 828,334
Int. Cl. C08g *20/32, 33/06*
U.S. Cl. 260—65 12 Claims

By adding a tertiary amine to a reaction mixture used for the preparation of polyimidazopyrrolone compositions, there is made possible the preparation of such compositions with higher solids content and without premature gelation.

3,640,961

FERROCENE-PHTHALALDEHYDE COPOLYMERS

Norman Bilow, 6118 S. Condon Ave., Los Angeles, Calif. 90056

Filed Mar. 6, 1969, Ser. No. 804,870
Int. Cl. C08g *1/10*
U.S. Cl. 260—67 R 1 Claim

Thermosetting ferrocene-containing copolymers and process for preparation of same are disclosed. The copolymers are prepared by the reaction of ferrocene or ferrocene derivatives with aromatic dicarboxaldehydes in the presence of a suitable catalyst. The copolymers cure, from low molecular weight soluble resins to insoluble resins of extremely high molecular weight upon treatment with heat and pressure. The products of this invention are useful in the fabrication of composite reinforced plastic structures.

3,640,962

POLYESTER POLYCONDENSATION PROCESS UNDER DECREASING TEMPERATURES

Albrecht Moschel, Kelkheim, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Apr. 28, 1969, Ser. No. 819,842
Claims priority, application Germany, May 8, 1968, P 17 70 350.3
Int. Cl. C08g *17/01*
U.S. Cl. 260—75 M 7 Claims

Process for the manufacture of polyesters containing free hydroxyl groups and having an acid number below 0.4 by condensing at least one dicarboxylic acid with at least one diol in a molar ratio of from 1:1.14 to 1:1.35 in the presence of a condensation catalyst, removing the main quantity of the water of condensation in a current of an inert gas under a pressure of 1,000 to 700 mm. of mercury and after-condensing under reduced pressure, which comprises reducing in stages or continuously during after-condensation the temperature in the range of from 210° C. to 165° C., and the pressure of from 800 to 1 mm. of mercury.

3,640,963

PROCESS FOR CURING POLYFERROCENYLENES

Norman Bilow, Los Angeles, Calif., and Harold Rosenberg, Dayton, Ohio, assignors to the United States of America as represented by the Secretary of the Air Force

No Drawing. Filed Mar. 6, 1969, Ser. No. 805,009
Int. Cl. C08g *1/10*
U.S. Cl. 260—67 R 7 Claims

A method of curing low molecular weight polyferrocenylenes. Low molecular weight polyferrocyenylenes are reacted with 1,1'-ferrocenedicarboxaldehyde or a substituted ferrocenedicarboxaldehyde in the presence of a suitable catalyst. This reaction produces a low molecular weight copolymer which, when subjected to heat and pressure, thermosets or cures to a hard, heat-resistant, radiation-resistant resin. The cured products of this invention are useful as resins in the formation of laminated structures.

3,640,964

DIBROMONEOPENTYL GLYCOL MODIFIED POLYESTERS

Mary J. Stewart, Media, and John A. Price, Swarthmore, Pa., assignors to FMC Corporation, Philadelphia, Pa.

No Drawing. Filed June 26, 1969, Ser. No. 836,980
Int. Cl. C08g *17/08*
U.S. Cl. 260—75 H 5 Claims

A linear polyester resin comprising the polycondensation product of (1) a glycol dicarboxylate or a precondensate of said dicarboxylate, prepared by a condensation reaction between an aliphatic glycol and a saturated aromatic dicarboxylic acid or lower alkyl diester thereof, and (2) a minor amount of dibromoneopentyl glycol.

3,640,965

THERMOPLASTIC SULFUR-CONTAINING POLYMERS

George Lewis Brode, Summerville, and Timothy Lee Pickering, Kendall Park, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Oct. 2, 1968, Ser. No. 764,598
Int. Cl. C08g *22/00, 22/18*
U.S. Cl. 260—77.5 AP 20 Claims

Polymers are disclosed that contain a plurality of units of the formula —SRS— which are derived from a dimercaptan of the tormula HSRSH in which the R represents a divalent, aliphatic, polycyclic radical, as defined hereinafter. The polymers may be homopolymeric, i.e., $—SRS—_x$ or copolymeric $—SRSY—_x$ in which x is the number of repeating units and Y is the divalent residue of a monomer which is copolymerizable with the dimercaptan.

3,640,966

PROCESS FOR THE PREPARATION OF POLYISOCYANATES WHICH CONTAIN A CARBODIIMIDE-ISOCYANATE ADDUCT

Hans Joachim Hennig, Cologne-Stammheim, and Peter Fischer, Cologne-Flittard, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 23, 1969, Ser. No. 793,547
Claims priority, application Germany, Jan. 25, 1968, P 16 68 083.4
Int. Cl. C08g *22/00, 22/18*
U.S. Cl. 260—77.5 R 9 Claims

Polyisocyanates containing a carbodiimide-isocyanate adduct are prepared by heating an organic polyisocyanate containing nitrogen atoms only in the isocyanato groups in the presence of a catalytic amount of a catalyst to a temperature above 150° C. and cooling the reaction product to about room temperature, wherein said catalyst is an organic isocyanate compound containing biuret, urea, amido, urethane, allophanate, isocyanurate, uretdione or uretonimine groups in the compound.

3,640,967

PROCESS FOR THE PREPARATION OF POLYURETHANES

Klaus König and Erwin Müller, Leverkusen, Wilhelm Kallert, Cologne-Stammheim, and Cornelius Mühlhausen, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,104
Claims priority, application Germany, Apr. 23, 1968, P 17 70 245.3
Int. Cl. C08g *22/10*
U.S. Cl. 260—77.5 6 Claims

A process for the preparation of polyurethanes, which may or may not be cross-linked, from higher molecular weight, linear dihydroxy compounds, diisocyanates and low molecular weight chain lengthening agents which contain at least two hydrogen atoms that are reactive with isocyanates, characterized in that the higher mo-

lecular weight dihydroxy compounds used are reaction products of ϵ-caprolactone and/or ϵ-hydroxycaproic acid, hexane-1,6-diol and diaryl carbonates.

3,640,968

CURABLE DIVINYL ACETAL COPOLYMERS

Maurice A. Raymond, Northford, Conn., assignor to Olin Corporation

No Drawing. Filed Feb. 11, 1970, Ser. No. 10,590
Int. Cl. C08f *15/40*; C08g *22/00*
U.S. Cl. 260—77.5 R 11 Claims

This invention relates to new copolymers of selected divinyl acetals and selected comonomers containing both a vinyl type unsaturation and an oxirane group. These copolymers have high tensile strength, high elongation and good adhesive properties and have utility as primers, adhesive and coatings for glass, plastics and metal.

3,640,969

PROCESS FOR PREPARING SOLUBLE POLYIMIDE BY THE POLYCONDENSATION OF MELLOPHANIC DIANHYDRIDE, PYROMELLITIC DIANHYDRIDE, AND AN AROMATIC DIAMINE, FOLLOWED BY IMIDATION OF THE POLYCONDENSATION PRODUCT

Shigeyuki Suzuki, Kanagawa, and Isamu Kaneda, Masaaki Takahashi, and Hiroshi Nagai, Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Feb. 3, 1969, Ser. No. 796,174
Claims priority, application Japan, Feb. 1, 1968, 43/6,141
Int. Cl. C08g *20/32*
U.S. Cl. 260—78 TF 17 Claims

A process for producing a soluble polyimide by the polycondensation of mellophanic and pyromellitic dianhydride and an aromatic diamine, followed by the imidation of the polycondensation product. A polyimide solution thus prepared is also claimed.

3,640,970

PROCESS FOR PREPARATION OF POLYAMIDES

Shuji Ozawa and Hiroshi Fujie, Tokyo, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Filed Feb. 14, 1969, Ser. No. 799,510
Claims priority, application Japan, Feb. 19, 1968, 43/10,414; Sept. 5, 1968, 43/63,860
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 R 8 Claims

A process for preparation of polyamides which comprises reacting substantially equimolar amounts of at least one diamine and a dihalide of at least one dicarboxylic acid and in an inert, non-basic organic medium to form a pre-condensate, and thereafter contacting said pre-condensate in said medium with an aqueous solution of a water-soluble acid acceptor. Thus high molecular-weight aromatic polyamides suitable for high temperature uses including co-polyamides having either random or block structure can be obtained with practical easiness even in large scale operations.

3,640,971

END-BLOCKED COPOLYMERS OF VINYL MONOMERS WITH CYCLIC MONOMERS AND METHOD FOR PREPARING THE SAME

Shitomi Katayama and Hideichi Horikawa, Akita, Japan, assignors to Denki Onkyo Co. Ltd., Tokyo, Japan

No Drawing. Filed Apr. 17, 1969, Ser. No. 817,162
Claims priority, application Japan, June 4, 1968, 43/38,169
Int. Cl. C08f *27/08, 27/00*
U.S. Cl. 260—78.3 R 13 Claims

End-blocked copolymers consisting of molecular chains of vinyl polymers connected at least at one chain terminal to the chain terminal of a ring-opened unit of two or more of the cyclic compounds of the group of β-lactones, ϵ-caprolactone and ethylene oxide, the connection between the vinyl chain and the chain of the cyclic compound being by way of amide or nitrogen. The invention also comprises a method for making the end-blocked copolymers in a three-step process, wherein the first step consists of polymerization of a vinyl-type monomer in the presence of a halogen compound yielding a polymer having a halogen at one or both chain ends, which is converted in a second step into an ω-aminopolymer by reaction with ammonia or an amide, and wherein the addition of one or more cyclic compounds of the group comprising a β-lactone, ϵ-caprolactone, and ethylene oxide is effected in a third step.

3,640,972

ADHESIVE COMPOSITIONS COMPRISING 2-CYANOACRYLATES AND HETEROCYCLIC COMPOUNDS

Bernard Joseph Bolger, 47 Kilterogh Road, Foxrocks, and Denis Joseph O'Sullivan, 130 St. Finton's Road, Sutton, both of Dublin, Ireland

No Drawing. Filed June 6, 1969, Ser. No. 831,254
Claims priority, application Ireland, Aug. 18, 1968, 1,006/68
Int. Cl. C08f *3/50, 3/74, 15/16*
U.S. Cl. 260—78.4 N 20 Claims

Improvements are made in the cure speed and bond performance of cyanoacrylate adhesives by using in conjunction therewith an imino- or unsaturated aliphatically substituted derivative of s-triazine, hexahydro-s-triazine or pyrimido [5,4-d] pyrimidine.

3,640,973

TIN SALTS OF PARTIALLY ESTERIFIED VINYL MONOMER-MALEIC ANHYDRIDE COPOLYMERS

Robert R. Chambers, Scarsdale, N.Y., Henry V. Isaacson, Minneapolis, Minn., and David W. Young, Homewood, Ill. (all % Sinclair Research, Inc., 400 E. Sibley Blvd., Harvey, Ill. 60426)

No Drawing. Application June 4, 1968, Ser. No. 734,202, which is a continuation-in-part of application Ser. No. 607,150, Jan. 4, 1967, now Patent No. 3,472,772, dated Oct. 14, 1969. Divided and this application May 25, 1970, Ser. No. 48,687
Int. Cl. C08f *27/06*
U.S. Cl. 260—78.5 T 5 Claims

Novel tin salts of partial esters of vinyl monomer-maleic anhydride polymers (e.g. styrene-maleic anhydride polymers), esterified with a thioalcohol or a hydroxythioether are formed by combination of the ammonium salt of said thioester and stannous chloride. Vinyl halide polymers are stabilized by incorporation of small amounts of these tin salts.

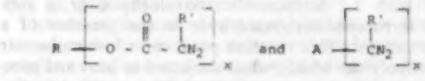
3,640,974

MODIFYING POLYMERS

David S. Breslow, Madelyn Gardens, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed May 5, 1969, Ser. No. 822,037
Int. Cl. C08f *3/20, 27/08*
U.S. Cl. 260—78.5 10 Claims

Vinyl chloride and vinylidene chloride polymers can be cross-linked or otherwise modified by reaction with a poly(diazo) compound selected from the group of



where x is an integer greater than 1, R is an organic radical inert to modification reactions, A is an aromatic radical inert to modification reactions, and R' is a hydrogen,

aryl or —COOZ radical where Z is an alkyl or aryl radical. The reaction between the poly(diazo) compound and polymer can be initiated either by heating or by exposing to ultraviolet radiation.

3,640,975

METHOD OF PROCESSING POWDERY ACCELERATORS PREPARED IN AN AQUEOUS MEDIUM

John W. Bilderback, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Feb. 3, 1969, Ser. No. 796,170

Int. Cl. C08c *11/54;* **C08f** *27/06*

U.S. Cl. 260—79.5 **5 Claims**

Coagulating a polymer latex during the preparation of a powdery accelerator so as to improve the processibility of the accelerator.

3,640,976

CERTAIN CYCLOALKYLSULFENAMIDES AS PREVULCANIZATION INHIBITORS

Kamel Boustany, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

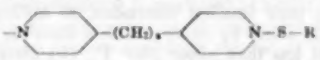
No Drawing. Filed Mar. 9, 1970, Ser. No. 17,866

Int. Cl. C08c *11/54, 11/62;* **C08f** *27/06*

U.S. Cl. 260—79.5 B **22 Claims**

Inhibiting premature vulcanization with cycloalkylsulfenamides of the formula

wherein *a* and *b* together with the nitrogen atom is piperidinyl, lower alkyl piperidinyl, aryl piperidinyl, 2,5-dilower alkyl pyrrolidinyl, hexamethyleniminyl, or



where *x* is one, two or three, and wherein R is cycloalkyl of 5 to 12 carbon atoms.

3,640,977

INTERPOLYMERS PREPARED FROM VINYL TOLUENE, ALPHA METHYL STYRENE DICYCLOPENTADIENE AND OPTIONALLY AN ACRYLIC COMPOUND

Carlos T. Gonzenbach, Scotia, and Manuel A. Jordan, Schenectady, N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

No Drawing. Filed May 6, 1969, Ser. No. 822,294

Int. Cl. C08f *15/40, 1/58, 17/00*

U.S. Cl. 260—80.78 **9 Claims**

Terpolymers are made from vinyl toluene, alpha methyl styrene and dicyclopentadiene and tetrapolymers from these materials and acrylic acid or methacrylic acid or an alkyl ester of such acids. The preferred polymers are tetrapolymers including butyl acrylate. The polymers are useful as hot melt adhesives and hot melt coatings.

3,640,978

CONTINUOUS PROCESS FOR THE PRODUCTION OF ALFIN POLYMERS BY POLYMERIZATION OF ALFIN MONOMERS IN AN ORGANIC SOLVENT AND FOR RECOVERING AND RECYCLING SOLVENT

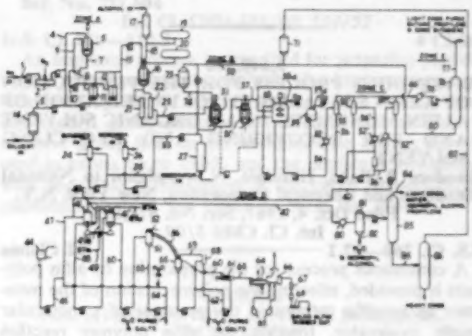
Theodore B. Baba, 32 Standish Road, Hilldale, N.J. 07642

Continuation-in-part of application Ser. No. 740,205, June 26, 1968. This application Mar. 6, 1970, Ser. No. 17,286

Int. Cl. C08d *3/02*

U.S. Cl. 260—82.1 **22 Claims**

A continuous process for the preparation of alfin polymers is provided, effecting the polymerization of the monomers by an alfin catalyst in the presence of a molecular weight moderator, treating the alfin polymer reaction mixture with oxygen to prevent conversion of organometallic acetylides and cyclopentadiene compounds into the corresponding acetylenes and cyclopentadiene, and separating unreacted monomer, volatile low polymer and solvent, and thereafter purifying solvent and recycling it and optionally the monomer for reuse, and washing and drying the alfin polymer.



In the process of the invention, molecular weight of the polymer is controlled by adjustment of the proportion of molecular weight moderator. No other modification of reaction conditions, proportions of catalyst, and other process variables is necessary.

3,640,979

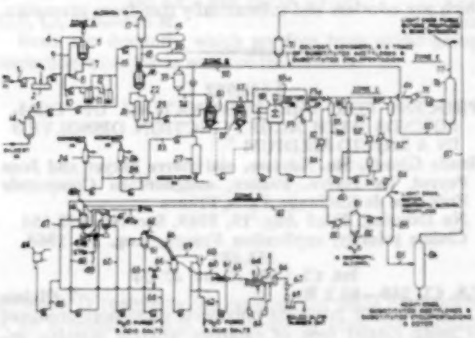
CONTINUOUS PROCESS FOR THE PRODUCTION OF ALFIN POLYMERS BY POLYMERIZATION OF ALFIN MONOMERS IN AN ORGANIC SOLVENT AND FOR RECOVERING AND RECYCLING SOLVENT

Theodore B. Baba, 32 Standish Road, Hillsdale, N.J. 07642

Continuation-in-part of application Ser. No. 740,158, June 26, 1968. This application Mar. 6, 1970, Ser. No. 17,287

Int. Cl. C08d *3/02*

U.S. Cl. 260—82.1 **26 Claims**



A continuous process for the preparation of alfin polymers is provided, effecting the polymerization of the monomer by an alfin catalyst in the presence of a molecular

weight moderator, treating the alfin polymer reaction mixture with an organic ester to convert sodium acetylides and sodium cyclopentadienes to acetylenic cyclopentadienic alcohols separating unreacted monomer, volatile low polymer, alcohols and solvent, thereafter purifying solvent and recycling it and optionally the monomer for reuse, and washing and drying the alfin polymer.

In the process of the invention, molecular weight of the polymer is controlled by adjustment of the proportion of molecular weight moderator. No other modification of reaction conditions, proportions of catalyst, and other process variables is necessary.

3,640,980

CONTINUOUS PROCESS FOR THE PRODUCTION OF ALFIN POLYMERS BY POLYMERIZATION OF ALFIN MONOMERS IN AN ORGANIC SOLVENT AND FOR RECOVERING AND RECYCLING SOLVENT

Theodore B. Baba, Hillsdale, N.J., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 4, 1967, Ser. No. 672,895
Int. Cl. C08d *5/00*
U.S. Cl. 260—82.1 **22 Claims**

A continuous process for the preparation of alfin polymers is provided, effecting the polymerization of the monomer by an alfin catalyst in the presence of a molecular weight moderator, treating the alfin polymer reaction mixture with a small amount carbon dioxide to convert organometallic compounds to organic acid salts, extracting the acid salts with water and separating unreacted monomer, volatile low polymer and solvent, and thereafter purifying solvent and recycling it and optionally the monomer for reuse, and washing and drying the alfin polymer.

3,640,981

VINYL TOLUENE-ALPHA METHYL STYRENE COPOLYMERS AND METHOD OF PREPARING THE SAME

Bernard J. Davis, Pass Christian, Miss., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

No Drawing. Filed Apr. 23, 1969, Ser. No. 818,792
Int. Cl. C08f *15/04*
U.S. Cl. 260—88.2 C **10 Claims**

Copolymers of alpha methyl styrene and vinyl toluene are prepared by polymerizing said monomers in presence of phosphorus pentafluoride as a catalyst in an aromatic diluent or in a blend of aromatic and aliphatic diluents. In addition triphenyl phosphite is employed to protect the copolymer during stripping. Said method results in clear resins giving water white solutions in mineral spirits, which are odorless and substantially free from aromatics.

3,640,982

PROCESS FOR THE ELIMINATING OF COMPOUNDS WITH ACID FUNCTION DISSOLVED IN A LIQUID MEDIUM

Claude Gluntz, Ste. Adresse, and Pierre Meyer and Jean Peyrot, Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, France

No Drawing. Filed Aug. 19, 1969, Ser. No. 852,154
Claims priority, application France, Aug. 20, 1968, 163,483
Int. Cl. C08f *15/04, 47/24*
U.S. Cl. 260—88.2 R **7 Claims**

A process for purifying polymeric substances produced by using Ziegler type of catalysts wherein metallic impurities are removed from a solution of the polymeric substance by contacting same with a basic graft polymer grafted onto an inert support. A representative support is poly(tetrafluoroethylene) and a precursor graft monomer is vinylpyridine.

3,640,983

METHOD OF MAKING COUPLER-BONDED-POLYMERS AND CHROMOGEN-BONDED-POLYMERS, AND POLYMERS MADE THEREBY

Shojiro Horiguchi, 965 Shimohoya, Hoyamachi, Kitatamagun, Tokyo, Japan, and Michiei Nakamura, 156, 5-chome, Motobuto-cho, Urama-shi, Saitama-ken, Japan

No Drawing. Filed Nov. 9, 1966, Ser. No. 593,002
Int. Cl. C08f *3/50, 3/64, 3/90*
U.S. Cl. 260—89.7 **7 Claims**

A method of making a coupler-bonded-polymer capable of being coupled with a diazonium compound, which comprises the steps of diazotizing a coupler containing a primary amino radical to produce a diazotized product stabilizing such diazotized product with a stabilizer to produce a stabilized diazonium compound, mixing the stabilized diazonium compound with an ethylenically unsaturated polymerizable monomer and polymerizing the monomer by utilizing the stabilized diazonium compound as a polymerization initiator to produce a coupler-bonded-polymer. A method of coloring articles with the use of the coupler-bonded-polymer thus produced is also provided.

3,640,984

POLYTETRAFLUOROETHYLENE

William A. Miller, Flemington, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Nov. 4, 1963, Ser. No. 321,353
Int. Cl. C08f *3/24*
U.S. Cl. 260—92.1 **17 Claims**

1. A method for preparing polytetrafluoroethylene adapted for molding precision parts and thin sheeting, comprising the sequential steps of (a) subjecting particles of polytetrafluoroethylene, which particles are at least 100 microns in their smallest dimension, to milling effected substantially solely by interparticulate collision, at a temperature of less than about 200° F.; (b) classifying the milled particles to separate therefrom particles having a maximum dimension of up to and including about 50 microns, wet-sieve size; and (c) subjecting the unseparated particles of larger than about 50 microns, wet-sieve size, repeatedly to the milling effected substantially solely by interparticulate collision, at a temperature of less than about 200° F.

3,640,985

POLYMERIZATION OF FLUORINE-CONTAINING ETHYLENICALLY UNSATURATED MONOMERS IN THE PRESENCE OF A BETA-HYDROXY-ALKYL TERTIARY-BUTYL PEROXIDE

Henry C. Stevens, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed May 16, 1969, Ser. No. 825,424
Int. Cl. C08f *3/22*
U.S. Cl. 260—92.1 **5 Claims**

Fluorine-containing ethylenically unsaturated monomers, e.g., vinylidene fluoride, are polymerized in an aqueous medium with an initiating amount of beta-hydroxyalkyl tertiary butyl peroxide.

3,640,986

POLYMERIZATION OF CYCLIC MONOOLEFINS

John E. Burleigh and Carl A. Uraneck, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,061
Int. Cl. C08f *7/02*
U.S. Cl. 260—93.1 **10 Claims**

Amines are employed as promoters in a process for the polymerization of cyclic monoolefins with a catalyst of a metal complex and an organo-metallic compound.

3,640,987

PROCESS FOR MANUFACTURING TITANIUM TRICHLORIDE, THE CATALYSTS OBTAINED THEREFROM AND THEIR USES IN THE POLYMERIZATION OF POLYMERIZABLE MONOMERS

Nhu Hung Phung, Antony, and Gilles Le Febvre, La Celle St. Cloud, France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Hauts-de-Seine, France

No Drawing. Filed June 3, 1968, Ser. No. 804,722
Claims priority, application France, June 1, 1967, 108,822
Int. Cl. C08f *1/42, 3/10*
U.S. Cl. 260—93.7 11 Claims

The present disclosure is directed to a process for manufacturing titanium trichloride by reducing titanium tetrachloride utilizing at least one reducing compound of a metal of Groups I to III, in an inert solvent. The process is carried out in two steps, the first step being conducted at a temperature lower than about 50° C. and the second step being conducted at a temperature higher than about 75° C. In the first step, the solvent has a normal boiling point lower than 140° C. and in the second step the solvent has a normal boiling point higher than 140° C.

3,640,988

PROCESS FOR THE POLYMERIZATION OF CONJUGATED DIENES WITH HALOARYLLITHIUM INITIATORS

William J. Trepka and Richard J. Sonnenfeld, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Dec. 31, 1969, Ser. No. 889,747
Int. Cl. C08d *3/04, 3/08, 3/12*
U.S. Cl. 260—94.2 M 5 Claims

1,3,5-tribromobenzene is employed as a polymerization modifier for the polymerization of conjugated dienes with haloaryllithium initiators wherein the use of the polymerization modifier reduces the molecular weight of the conjugated diene polymer while the high percentage of cis-configuration of the conjugated diene polymer is maintained.

3,640,989

NOVEL BINARY CATALYST SYSTEM FOR THE POLYMERIZATION OF DIOLEFINS

Morford C. Throckmorton, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed May 2, 1969, Ser. No. 821,499
Int. Cl. C08d *3/06*
U.S. Cl. 260—94.3 8 Claims

There is disclosed a process for the polymerization of butadiene and butadiene in mixture with other conjugated diolefins to form polymers containing a high portion of the butadiene units in the cis-1,4 configuration comprising contacting at least one diolefin under polymerization conditions with a binary catalyst system comprising (A) at least one compound selected from a group consisting of organonickel and organocobalt compounds of fluorine containing (1) carboxylic acids, (2) aldehydes, (3) ketones and (4) phenols, and (B) at least one organometallic compound wherein the metal is selected from Groups I, II and III of the Periodic Table.

3,640,990

TERMINATION OF DIENE POLYMERIZATION

Floyd E. Naylor, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed June 29, 1970, Ser. No. 50,935
Int. Cl. C08d *1/38, 3/04, 3/08*
U.S. Cl. 260—94.7 5 Claims

A method for terminating the polymerization of monomers, in which polymerization there is formed a metal-terminated polymer, which involves introducing into the reaction mixture a system comprised of a polyisocyanate and a lactone.

3,640,991

MIXED ANHYDRIDE METHOD OF PREPARING PEPTIDES

Francis Marc Callahan, Stony Point, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 622,049, Mar. 10, 1967. This application Oct. 29, 1968, Ser. No. 771,604
Int. Cl. C07c *101/00, 103/52*
U.S. Cl. 260—112.5 4 Claims

An improved process is described for preparing peptides by the mixed anhydride method. The improvement consists in using certain special amines which have at least one methyl group attached to nitrogen, and an electronegative group Beta to the nitrogen. The amines may be used in excess up to 150% and the peptide is synthesized with negligible racemization of the stereo isomers of the constituents which are joined to form the peptide.

3,640,992

NAPHTHOQUINONE DIAZIDE SULFONIC ACID ESTER

Oskar Sus and Fritz Uhlig, Wiesbaden-Beibrich, and Heinz Schafer, Wiesbaden-Sonnenberg, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

No Drawing. Filed June 5, 1967, Ser. No. 643,378
Claims priority, application Germany, July 27, 1966, K 59,885
Int. Cl. C07c *113/00;* G03c *1/52*
U.S. Cl. 260—141 1 Claim

This invention relates to a light-sensitive ester of a naphthoquinone diazide sulfonic acid and to a process for making the ester. The ester has enhanced solubility and is useful in photomechanical reproduction processes.

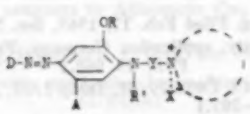
3,640,993

BASIC AZO DYESTUFFS CONTAINING AN N-ACYL-AMINO-N'-PYRIDINIUM LOWER ALKYL-ENEAMINOPHENYL GROUP

Gert Hegar, Schoenenbuch, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Filed Nov. 26, 1968, Ser. No. 779,255
Claims priority, application Switzerland, Dec. 6, 1967, 17,110/67; Oct. 15, 1968, 15,402/68
Int. Cl. C09b *29/36, 43/00*
U.S. Cl. 260—146 R 11 Claims

Basic azo deystuffs, which are free from acidic groups imparting solubility in water of the formula



in which D represents the residue of a diazo component, A an acylamino group, Y a linear or branched aliphatic carbon chain, R' represents hydrogen or an alkyl, aralkyl or cycloalkyl residue, R an alkyl, aralkyl, cycloalkyl or aryl residue and X an anion. The dyestuffs are suitable for use in dyeing and printing; are suitable for the bulk coloration of polyacrylonitrile polymers and are fast to light and washings.

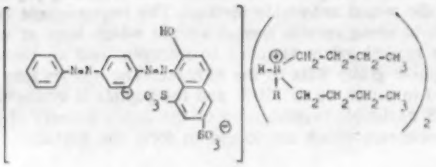
3,640,994

DISAZO DYE SALTS

Horst Harnisch, Cologne, Buchheim, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 30, 1969, Ser. No. 820,671
Claims priority, application Germany, May 9, 1968, P 17 69 328.6
Int. Cl. C09b *31/06*
U.S. Cl 260—191 3 Claims

Dye salts of the formula



in which R is hydrogen or alkyl with 1–4 carbons are produced for use in bulk coloring of lacquers and organic synthetic materials especially polypropylene.

3,640,995

MONOAZO COMPOUNDS CONTAINING AN AROYL-AMINO - N - ALKOXYCARBONYL BENZYLANILINE COUPLING COMPONENT

Max A. Weaver, Herman S. Pridgen, and Clarence A. Coates, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,780
Int. Cl. C09b *29/06*; D06p *1/02*
U.S. Cl. 260—207.1 7 Claims

Azo compounds containing a phenyl, thiazolyl, benzothiazolyl, or thienyl diazo component and m-aroylamino-N-alkoxycarbonylbenzylaniline coupling component are useful as dyes for hydrophobic textile materials.

3,640,996

DISPERSE WATER-INSOLUBLE BENZENEAZO-3-ACETYL- OR 3-PROPIONYL-AMINODIPHENYLAMINE DYESTUFFS

Hans-Juergen Sturm, Gruenstadt, and Kurt Mayer, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Feb. 17, 1969, Ser. No. 799,929
Claims priority, application Germany, Feb. 23, 1968, P 17 19 060.2
Int. Cl. C09b *29/08*; D06p *1/08, 3/52*
U.S. Cl. 260—207.1 4 Claims

Disperse water-insoluble azo dyes in which a diazo component, e.g. of the benzene series, is coupled to 3-acetylamino or 3-propionylamino-diphenylamine as the coupling component; these dyes wherein the nitrogen atom of the diphenylamine is substituted by methyl, ethyl, β-hydroxy-ethyl or -propyl, β-hydroxy-γ-propyl, or β-acetoxy-ethyl or -propyl, when used alone or in mixtures with the corresponding compounds having the unsubstituted nitrogen atom are especially useful for the dispersion dyeing of synthetic linear polyester fibrous materials.

3,640,997

SUCROSE-ETHYLENE DIAMINE POLYOLS AND PROCESS FOR PREPARING SAME

Walter R. Fijal, Trenton, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Continuation-in-part of application Ser. No. 605,178, Dec. 28, 1966. This application May 7, 1969, Ser. No. 822,702
Int. Cl. C07c *47/18*
U.S. Cl. 260—209 R 10 Claims

A sucrose-ethylene diamine polyol is prepared by reacting a mixture of sucrose and ethylene diamine with an alkylene oxide in the presence of a caustic catalyst. The polyol is used to prepare polyurethane foam products having excellent dimensional stability and physical properties. The polyurethane foams are used in preparing molded articles and as insulation for refrigerators, freezers, and the like.

3,640,998

ALKYLENE OXIDE ADDUCTS OF ALKYL OLIGOSACCHARIDES AND THEIR MIXTURES WITH ALKYLENE OXIDE ADDUCTS OF BOTH ALKYL GLUCOSIDES AND ALKANOLS

Richard C. Mansfield, Dersher, and James L. Rainey, Abington, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Filed June 18, 1969, Ser. No. 834,558
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 R 10 Claims

Surface active alkylene oxide adducts of alkyl oligosaccharides, and alkylene oxide adducts of mixtures of alkyl oligosaccharides, alkyl glucosides and alkanols, are prepared from an alkanol and glucose via a transacetalation reaction, followed by oxyalkylation. Preparation of these compositions may be carried out by reacting glucose and a lower alkanol in the presence of an acid catalyst to form a mixture of lower alkyl glycosides and alkyl oligosaccharides which are then reacted with higher alkanols to form the desired intermediates, followed by incorporation of ethylene and/or propylene oxides into the components of the mixture.

3,640,999

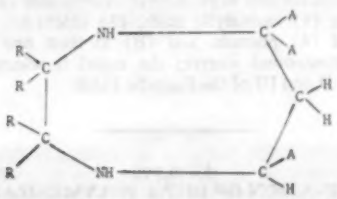
PROCESS FOR PREPARING SUBSTITUTED 1,4-DIAZACYCLOHEPTANES

Alberto Bonvicini and Giuseppe Cantatore, Terni, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed Oct. 10, 1967, Ser. No. 674,114
Claims priority, application Italy, Oct. 14, 1966, 28,858/66
Int. Cl. C07d *53/02*
U.S. Cl. 260—239 BC 5 Claims

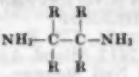
Process for preparation of alkyl-substituted 1,4-diazacycloheptanes of the general Formula I

(I)



wherein R may be the same or different and is a hydrogen or an alkyl group having from about 1 to 12 carbon atoms and A may be the same or different and is selected from the group consisting of hydrogen and an alkyl group having from about 1 to 12 carbon atoms, this

process comprising reacting, in the presence of an acid catalyst, an ethylenediamine of the general Formula 2



(2)

wherein R is as previously defined, with a saturated aliphatic ketone of the formula R'—CO—R', where the R' may be the same or different and is an alkyl group having from about 1 to 12 carbon atoms, and thereafter subjecting the resulting material to catalytic hydrogenation.

3,641,000

N-SULFONYLCARBOXAMIDE PENICILLINS

John H. Sellstedt, St. Davids, and Scott J. Childress, Philadelphia, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 3, 1969, Ser. No. 830,123

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **4 Claims**

This invention concerns N-sulfonylcarboxamide penicillins having potent activity against gram-positive and gram-negative microorganisms.

3,641,001

PROCESS FOR PREPARING α-CARBOXYBENZYLPENICILLIN

Dennis Anthony Love, Redhill, David Patrick John Neal, Reigate, and Eric Pidgeon, Worthing, England, assignors to Beecham Group Limited, Brentford, England

No Drawing. Filed Oct. 9, 1969, Ser. No. 865,182

Claims priority, application Great Britain, Oct. 23, 1968, 50,204/68

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **4 Claims**

α-Carboxybenzylpenicillin and non-toxic salts are prepared by reacting 6-aminopenicillanic acid or a salt with a β-oxo-α-phenylacryloyl halide, preferably the chloride. An acid binding agent is present during the reaction. The β-oxo-α-phenylacryloyl halides are prepared from phenylmalonic acid and a halogenating agent such as PCl_3, PCl_5 or $POCl_3$.

3,641,002

BENZODIAZEPINE DERIVATIVES AND SALTS THEREOF

Hisao Yamamoto, Nishinomiya-shi, Sumio Kitagawa, Moriguchi-shi, Shigeho Inaba, Takarazuka-shi, Shigeru Sakai, Toyonaka-shi, Toshiyuki Hirohashi, Kobe, Isamu Maruyama, Minoo-shi, Mitsuhiro Akatsu, Ikeda-shi, and Takahiro Izumi, Takarazuka-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

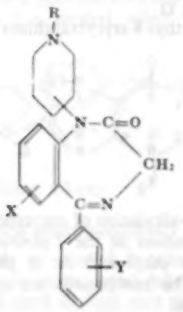
No Drawing. Filed June 9, 1969, Ser. No. 831,732

Claims priority, application Japan, June 13, 1968, 43/41,109; July 1, 1968, 43/46,042

Int. Cl. C07d *53/06*

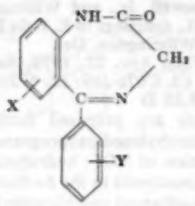
U.S. Cl. 260—239.3 **5 Claims**

Novel 1-substituted 1,4-benzodiazepin-2-one derivatives represented by the formula,

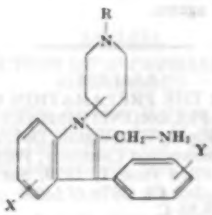


wherein R signifies a lower alkyl group, and X and Y signify respectively a hydrogen atom, a halogen atom, a nitro group or a trifluoromethyl group, which are effective as tranquilizers, muscle-relaxants and hypnotics, are produced by reacting with a reactive ester of a piperidinol derivative of the formula,

wherein R is as defined above, a 1,4-benzodiazepin-2-one derivative represented by the formula,



wherein X and Y are as defined above, or contacting, with an oxidizing agent, a 2-aminomethyl-indole derivative represented by the formula,



wherein R, X and Y are as defined above.

3,641,003

METHOD OF PREPARING AN α-AMINO-ω-LACTAM

Tomiyasu Ito, Kanagawa-ken, Koichiro Nagata, Tokyo, and Takehiko Ichikawa and Tetsuya Kato, Kanagawa-ken, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed Nov. 4, 1969, Ser. No. 874,066

Claims priority, application Japan, Nov. 18, 1968, 43/84,361

Int. Cl. C07d *41/06*

U.S. Cl. 260—239.3 **9 Claims**

α-Amino-ε-caprolactam and its homologs having carbon chains of 5 to 12 members are prepared in high yield from the α-aminocycloalkanone oximes having the same number of carbon atoms by Beckmann rearrangement in the presence of chlorosulfonic acid or sulfur trioxide. The lactams are useful intermediates in the synthesis of the corresponding diamino acids.

3,641,004

ALKYL ESTERS OF 6-(BENZENESULFONYL)-TRIHALO-2-PICOLINIC ACID

R. Garth Pews and Fred P. Corson, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Sept. 18, 1969, Ser. No. 859,185
Int. Cl. A61k *27/00*; C07d *31/48*
U.S. Cl. 260—239.8 7 Claims

Disclosed are alkyl esters of 6-(benzenesulfonyl)-trihalo-2-picolinic acid and their preparation. These compounds are useful as pesticides.

3,641,005

PROCESS FOR THE PREPARATION OF Δ^4-6,6-DIFLUORO - 3,20 - DIKETO - 17α,21-DIHYDROXY-PREGNENES

George Albert Boswell, Jr., and William Charles Ripka, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 22, 1970, Ser. No. 31,004
Int. Cl. C07c *169/32*, *173/00*
U.S. Cl. 260—239.55 D 11 Claims

Title compounds are prepared from Δ^5-3-alkanoyl-17α,20; 20,21-bismethylenedioxypregnenes by a process involving the addition of NOF; hydrolysis of the resulting 5α-fluoro-6-nitriminosteroid to the 5α-fluoro-6-ketosteroid; hydrolysis of the 3-alkanoyl and bismethylenedioxy groups with 48% hydrofluoric acid; acetylation of the 3-, 17α-, and 21-hydroxyls, fluorination with sulfur tetrafluoride to the corresponding 5α,6,6-trifluorosteroid; hydrolysis of all acetyl groups; re-formation of the 17α,20; 20,21-bismethylenedioxy group; oxidation of the 3-hydroxyl to the 3-ketone; dehydrofluorination in the C_4–C_5 positions; and removal of the bismethylenedioxy group. An alternative route also is proposed. Title steroids having an oxygenated function in the 11β-position are useful antiinflammatory and glucocortical agents.

3,641,006

PROCESS FOR THE PREPARATION OF STEROID α-FLUORONITRIMINES

William Charles Ripka, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 1, 1970, Ser. No. 42,558
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 C 6 Claims

Nitrosyl tetrafluoroborate reacts with certain steroids having carbon-carbon double bonds to give the corresponding steroid α-fluoronitrimines. Use of a mixture of nitrosyl fluoride with nitrosyl tetrafluoroborate considerably improved the yield of α-fluoronitrimines over that obtained with either nitrosyl fluoride or nitrosyl tetrafluoroborate alone. The steroid α-fluoronitrimines, produced by this process, are intermediates to biologically active products, which have a broad range of hormonal activities.

3,641,007

UNSATURATED PREGNA-3,20-DIONE-[17α,16α-d]-OXAZALINES

Giangiacomo Nathansohn, Milan, Gianfranco Odasso, Cusano Milanino, and Pietro de Ruggieri and Umberto Guzzi, Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

No Drawing. Filed May 1, 1969, Ser. No. 821,150
Claims priority, application Italy, May 3, 1968, 16,028/68
Int. Cl. C07c *173/10*
U.S. Cl. 260—239.55 13 Claims

The invention relates to pregn-4-ene-3,20-dione-[17α, 16α-d]-oxazolines, substituted or unsubstituted at positions 6 and 2', and wherein additional double bonds Δ^1 and/or Δ^6 may be present. Said compounds possess progestinic activity.

3,641,008

PROCESS FOR THE PREPARATION OF PREGN-5-ENE-4,20-DIONES AND INTERMEDIATES IN THE PRODUCTION THEREOF

Bernard Ellis, Graham St., City Road, London, England; Vladimir Petrow, 7612 Miami Ave., Cincinnati, Ohio 45245; and David Neil Stanway, 65 Wicks Crescent, Formby, England

No Drawing. Continuation-in-part of applications Ser. No. 612,363, Jan. 30, 1967, and Ser. No. 612,833, Jan. 31, 1967, now Patent No. 3,478,069. This application May 7, 1969, Ser. No. 822,684
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 12 Claims

Novel 4-oxo-Δ^5-steroids having utility as intermediates for preparation of hormonally active steroids, are prepared by sulfonylating 3β-hydroxy - 4β - hydroxy or acetoxy-Δ^5-steroids to provide novel 3β-sulfonyloxy steroid intermediates, followed by reacting the 3β-sulfonyloxy steroid intermediates with an alkaline reagent.

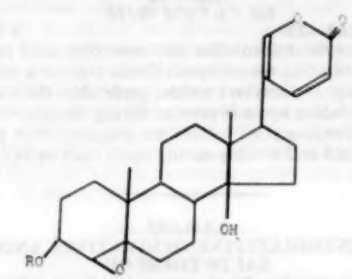
3,641,009

CARDIO-ACTIVE OXIDO-BUFADIENOLIDES

Kurt Radscheit, Kelkheim, Taunus, Ulrich Stache and Werner Haede, Hofheim, Taunus, Werner Fritsch, Neuenhain, Taunus, and Ernst Lindner, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Dec. 2, 1969, Ser. No. 881,582
Claims priority, application Germany, Dec. 5, 1968, P 18 12 943.6
Int. Cl. C07c *173/04*
U.S. Cl. 260—239.57 2 Claims

Cardio-active oxido-bufadienolides of the formula



wherein R is hydrogen or lower acyl, and a method for making them.

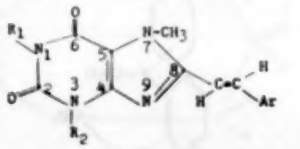
3,641,010

NOVEL XANTHINE COMPOUNDS AND MEANS FOR OBTAINING THE SAME

Dieter Schweiss and Loren M. Long, Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

No Drawing. Continuation-in-part of application Ser. No. 846,594, July 30, 1969. This application June 11, 1970, Ser. No. 45,594
Int. Cl. C09b *23/14*; C07d *57/40*
U.S. Cl. 260—240 D 6 Claims

1,3-dialkyl-7-methyl-8-styrylxanthines (I)



I

are provided by N-alkylation of corresponding compounds at either the 1-position or the 7-position; where R_1 and R_2 are methyl or ethyl and Ar is phenyl or 3,4,5-trimethoxyphenyl. The compounds are cerebral stimulants of the caffeine type.

3,641,011

5- AND 6-DIALKYLAMINOBENZYLIDENE-AMINOFLUORANS

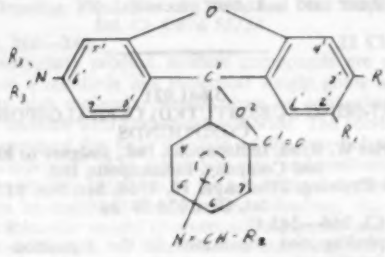
Chao-Han Lin, Dayton, and Arthur J. Wright, Cincinnati, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Jan. 21, 1969, Ser. No. 792,277

Int. Cl. C07d *21/00*

U.S. Cl. 260—240 G 5 Claims

A novel chromogenic material of normally colorless form is disclosed, having a structural formula:



wherein R_2 represents a dialkylaminophenyl radical, R and R_1 comprise hydrogen, halogen, and alkyl radicals and R_3 represents alkyl radicals having less than five carbon atoms—said materials assuming a colored form upon reactive contact with a Lewis acid molecule. Examples include 6'-diethylamino-5-(p-dimethylaminobenzylidene) amino - 2',3' - dimethylfluoran and 2'-chloro-6'-diethylamino - 6-(p-dimethylaminobenzylidene)amino-3'-methylfluoran.

3,641,012

STYRYL THIAZOLIUM SALTS

Arthur P. Phillips, East Chester, and Robert B. Burrows, Ardsley, N.Y., assignors to Burroughs Wellcome Co.

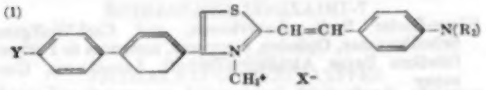
No Drawing. Filed Sept. 19, 1968, Ser. No. 760,966

Claims priority, application England, Sept. 22, 1967, 43,366/67

Int. Cl. C09b *23/14*

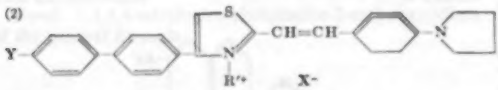
U.S. Cl. 260—240.9 6 Claims

Styryl thiazolium salts of the following structures:



where

Y is hydrogen or lower alkoxy
X^- is an anion of a pharmaceutically acceptable acid
R is lower alkyl (i.e. methyl, ethyl, propyl etc.)



where

Y is hydrogen or lower alkoxy
R' is lower alkyl
X^- is an anion of a pharmaceutically acceptable acid.

The compounds are useful in eliminating nematodes (i.e. hookworms, pinworms, etc.) inhabiting the intestinal track of mammals such as dogs, cats etc.

3,641,013

17β-HYDROXY-18-METHYL-4-ESTRENE-3-ONE AND DERIVATIVES THEREOF

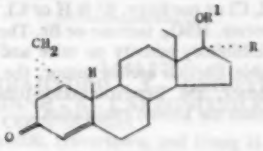
Otto Engelfried, Friedmund Neumann, and Rudolf Wiechert, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

No Drawing. Filed Sept. 9, 1968, Ser. No. 759,535

Int. Cl. C07c *169/22*

U.S. Cl. 424—243 9 Claims

Racemic and optically active 17β-hydroxy-18-methyl-4-estrene-3-one derivatives characterized by anabolic activity having the formula:



wherein R is hydrogen or saturated or unsaturated hydrocarbyl and R^1 is hydrogen or acyl.

The process of preparing the above compounds comprises introducing into the 4,5-position of the saturated A-ring of the 1α,2α-methylene-3-ketosteroid a double bond and thereafter if desired the free 17-hydroxy group in the resulting product is acylated or saponified to a 17-acyloxy group.

3,641,014

REDUCTION OF Δ^3-CEPHALOSPORIN SULFOXIDES

Charles F. Murphy, J. Alan Webber, Gary V. Kaiser, Earle M. Van Heyningen, Ian G. Wright, and Robin D. G. Cooper, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed Oct. 3, 1968, Ser. No. 764,925

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 13 Claims

Process for reducing cephalosporin sulfoxides with certain reducing agents in the presence or absence of acid halide activators to produce cephalosporins useful in an overall process for the manufacture of cephalosporin antibiotics, e.g., cephalothin, cephaloglycin, and the like, from penicillins.

3,641,015

7 - (PHENYLACETYLAMINO)CEPHALOSPORIN CARBOXAMIDES AND 7 - (THIOPHENE - 2-ACETYLAMINO) CEPHALOSPORIN CARBOXAMIDES

Benjamin Arthur Lewis, Suffern, Martin Leon Sassiver, Monsey, and Robert Gordon Shepherd, South Nyack, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Jan. 17, 1969, Ser. No. 792,151

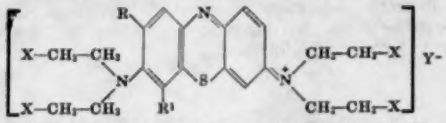
Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 8 Claims

This disclosure describes compounds of the class of 7-(phenylacetylamino)cephalosporin carboxamides and 7-(thiophene-2-acetylamino)cephalosporin carboxamides, useful as anti-bacterial agents.

3,641,016
THIONINE DERIVATIVES
Jeno Korosi and Gyorgy Csaba, Budapest, Hungary, assignors to Egyesult Gyogyszer es Tapszergyar, Budapest, Hungary
No Drawing. Filed Feb. 3, 1969, Ser. No. 796,216
Claims priority, application Hungary, Feb. 16, 1968, EE-1,491
Int. Cl. C07d 93/12
U.S. Cl. 260—243 1 Claim

New compounds having the formula



(I

wherein R is H, Cl or methoxy, R^1 is H or Cl, X is Cl, and Y is Cl, perchlorate, HSO_4, tartrate or Br. The compounds show a better inhibitory activity on mice and rats against the transplantable Ehrlich ascites tumor, the C_3H-tumor, the Yoshida-tumor, the Benevolenskaja-tumor and the Guerin-tumor than the known cytostatica.

3,641,017
THIENO[1,2,4]THIADIAZINES
John G. Topliss, West Caldwell, N.J., assignor to Schering Corporation, Bloomfield, N.J.
No Drawing. Filed May 20, 1969, Ser. No. 826,293
Int. Cl. C07d 93/22
U.S. Cl. 260—243 D 10 Claims

This invention relates to novel substituted thieno [1,2,4] thiadiazine-1,1-dioxides, to methods for preparing and to methods for using the same as anti-hypertensive agents.

3,641,018
PROCESS FOR PREPARING 7-AMINO CEPHALOSPORANIC ACID
Harold B. Hayes and Gerald L. Huff, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
No Drawing. Filed June 26, 1969, Ser. No. 836,953
Int. Cl. C07d 99/24
U.S. Cl. 260—243 10 Claims

The preparation of 7-aminocephalosporanic acid (7-ACA) from cephalosporin C by treatment with a halogenating agent to obtain the imino chloride, conversion of the imino chloride to an imino ether, and hydrolysis of the imino ether is improved if the amino group in the adipamyl side chain is protected by a halo lower alkanoyl group. A further improvement is realized by using an amine salt of the N-haloalkanoylcephalosporin C.

3,641,019
THIAZOLO-as-TRIAZINES
Donald L. Trepanier and Paul E. Krieger, Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Aug. 30, 1968, Ser. No. 756,411
Int. Cl. C07d 91/42
U.S. Cl. 260—248 AS 6 Claims

Substituted thiazolo[3,2-b] or [2,3-c]-as-triazines and their methohalides and pharmaceutically-acceptable salts such as 3,4-dihydro-6-phenyl-2,4-dimethyl-2H-thiazolo-[2,3-c]-as-triazine hydrobromide are prepared by the reaction of a substituted tetrahydro-as-triazine-3(2H)-thione with a 1,2-disubstituted ethane such as 1,2-dibromoethane or a 1-nitriol-2-phenyl-2-toluenesulfonyloxy-ethane. The novel compounds have pharmacological activity, notably as antidepressants as indicated by their antagonism of reserpine and their potentiation of amphetamine, and they are also useful in potentiation of barbiturates.

3,641,020
SYNTHESIS OF CYANURIC FLUORIDE
Richard W. Anderson and Hughie R. Frick, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Jan. 23, 1969, Ser. No. 793,596
Int. Cl. C07d 55/42
U.S. Cl. 260—248 CS 6 Claims

A process for the efficient synthesis of cyanuric fluoride is provided. The process comprises contacting certain cyanuric halides with selected alkali metal fluorides in the presence of a perhalocarbonyl compound. The process of the present invention provides for the production of cyanuric fluoride at considerably reduced temperatures, than those used in known processes.

3,641,021
3,7-(RING-SUBSTITUTED) CEPHALOSPORIN COMPOUNDS
Charles W. Ryan, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
No Drawing. Filed Apr. 18, 1969, Ser. No. 817,556
Int. Cl. C07d 99/24
U.S. Cl. 260—243 C 9 Claims

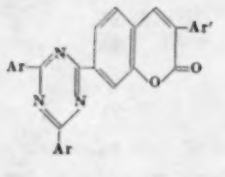
Cephalosporins substituted in the 3-position with a mercaptothiazole or mercaptotetrazole and in the 7-position with a phenyl- or thienylacetyl group bearing an alpha amino or hydroxy group are highly-active antibiotics yet are unusually stable toward cephalosporinases and metabolizing liver enzymes.

3,641,022
LIQUID PHASE PROCESS FOR THE PRODUCTION OF N-ALKYL MORPHOLINES
Daniel R. Chisholm, Mount Vernon, N.Y., and Jack M. Solomon, West Caldwell, and Bernard Isbitsky, Paramus, N.J., assignors to Witco Chemical Corporation, New York, N.Y.
No Drawing. Filed Feb. 12, 1969, Ser. No. 798,761
Int. Cl. C07d 87/24
U.S. Cl. 260—247 6 Claims

Long chain N-alkyl morpholines are prepared by a liquid phase process at atmospheric pressure by cyclodehydration of the corresponding N-substituted dialkanolamine in the presence of an activated alumina catalyst.

3,641,023
7-TRIAZINYL-COUMARINS
Klaus-Dieter Bode, Leverkusen, and Carl-Wolfgang Schellhammer, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Apr. 4, 1969, Ser. No. 813,707
Claims priority, application Germany, Apr. 11, 1968, P 17 70 182.5
Int. Cl. C07d 7/28
U.S. Cl. 260—248 CS 6 Claims

7-triazinyl-coumarin of the formula



in which Ar and Ar' are identical or different, optionally substituted aromatic or hetero-aromatic radicals, and

the coumarin ring may be further substituted, useful as brightening agents are disclosed. These compounds are prepared by reacting the corresponding coumarin-7-carboxylic acid chloride with Ar–CN in the presence of aluminum and ammonium chloride.

3,641,024

LOW MOLECULAR WEIGHT POLYISOCYANATES

Perry A. Argabright, Littleton, Colo., and Harold D. Rider, Barrington, Ill., assignors to Marathon Oil Company, Findlay, Ohio

No Drawing. Filed Nov. 1, 1968, Ser. No. 772,860
Int. Cl. C07d 55/38
U.S. Cl. 260—248 21 Claims

Polyisocyanate product mixture compounds are separated into a relatively low molecular weight phase and a relatively high molecular weight phase by contacting the product mixture with carbon tetrachloride. The solvent is readily removed for final isolation of the two polyisocyanate components. The polyisocyanate compositions are useful as starting materials in the production of urethane polymers as coatings, films, foams, adhesives, etc. The higher molecular weight products are especially useful in these areas because of their inherent thermostability and flame retardancy provided by the high concentration of isocyanurate rings in the molecule.

3,641,025

STOICHIOMETRIC REGULATION IN CHEMICAL REACTIONS INVOLVING A HIGHLY REACTIVE ACID CHLORIDE, ANHYDRIDE OR A DERIVATIVE THEREOF

Harris E. Petree, Spanish Fort, Ala., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Oct. 30, 1968, Ser. No. 771,971
Int. Cl. C07d 55/18
U.S. Cl. 260—249.5 5 Claims

A method for maintaining the stoichiometry in a reaction between a highly reactive acid chloride or anhydride including derivatives thereof having moieties of differing reactivities and a co-reactant by addng to the reaction medium a fluorescent amine so as to determine the amount of unreacted acid chloride (or anhydride or derivative thereof) present in the reaction medium and adjusting the flow of said reactive acid chloride (or anhydride or derivative thereof) or the co-reactant to the reaction medium so as to maintain the desired stoichiometric ratio.

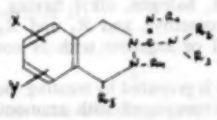
3,641,026

PHTHALAZINE DERIVATIVES

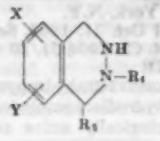
Harm Jan Panneman, Vijversingel, Netherlands, assignor to Organon Inc., West Orange, N.J.

No Drawing. Filed June 9, 1969, Ser. No. 831,715
Claims priority, application Netherlands, July 23, 1968, 6810452
Int. Cl. C07d 51/06
U.S. Cl. 260—250 4 Claims

Novel 1,2,3,4-tetrahydro-phthalazine-2-carboxamidines of the general formula:



in which R_1, R_2, R_3, R_4 being H or a C_{1-4} alkylgroup, R_5 is H, lower alkyl, aryl, aralkyl and X and Y are H, OH, SH, lower alkyl or alkoxy, Hl, NH_2, CF_3, sulfamyl and acid addition salts of these compounds. They can be prepared from



by appropriate substitution of the hydrogen carrying nitrogen atom.

3,641,027

5,6,7,8-TETRAHYDRO - 5 - OXO-PYRIDO[2,3-d]-PYRIMIDINE - 6 - CARBONITRILES AND RELATED COMPOUNDS

Arthur A. Santilli, Havertown, and Dong H. Kim, Wayne, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Aug. 14, 1968, Ser. No. 752,485
Int. Cl. C07d 57/20
U.S. Cl. 260—256.4 F 5 Claims

The disclosure is directed to 5,6,7,8-tetrahydro-5-oxopyrido[2,3-d]pyrimidine-6-carbonitriles and to 4-[(2-cyanoethyl)alkylamino]-5-primidine carboxylic acid esters which are intermediates in their preparation. Both the final products and the intermediates have central nervous system activity as depressants.

3,641,028

5-HYDROXY - 7H - PYRROLO[2,3-d]PYRIMIDINE-6-CARBOXYLIC ACID ESTERS AND RELATED COMPOUNDS

Dong H. Kim, Wayne, and Arthur A. Santilli, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Aug. 14, 1968, Ser. No. 752,487
Int. Cl. C07d 57/14
U.S. Cl. 260—256.4 F 2 Claims

The disclosure is directed to 5-hydroxy-7H-pyrrolo [2,3-d]pyrimidine-6-carboxylic acid esters and to 4-[carboxyalkyl)amino]5-pyrimidinecarboxylic acid esters. All these compounds have central nervous system activity as depressants while the latter compounds may also be used in the preparation of the former compounds.

3,641,029

SUBSTITUTED BENZOXAZOLECARBOXAMIDES AND BENZOTHIAZOLECARBOXAMIDES

William Blythe Wright, Jr., Woodcliff Lake, N.J., and Herbert Joseph Brabander, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Feb. 2, 1970, Ser. No. 8,088
Int. Cl. C07d 51/70
U.S. Cl. 260—268 BC 6 Claims

The preparation of N-(tert-aminoalkyl) substituted benzoxazolecarboxamides and benzothiazolecarboxamides, are described. One method is by reacting benzoxazol or benzothiazole carboxylic acids with N,N'-carbonyldiimidazole and subsequently with a substituted alkylene amine. Other methods are also described for the preparation of the desired compounds. The compounds are useful for their (CNS) activity in the field of tranquilizers, and (CNS) depressants.

3,641,030

4,5-DIHYDRO-N-(4-PHENYL-1-PIPERAZINYLCARBONYL-1H[1,4]-DIAZEPINO[1,2-a]INDOLE

Meier E. Freed, Philadelphia, and Elisabeth Hertz, Bryn Mawr, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Oct. 21, 1968, Ser. No. 769,388
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 TR **1 Claim**

This invention concerns tetrahydropyrazinoindole-2-carboxamides and dihydrodiazepinoindole-2-carboxamides which are pharmacologically active as central nervous depressants.

3,641,031

10-(PIPERAZINYL OR HEXAHYDRODIAZEPINE)-THIENO[3,2-b][1,5]BENZOTHIAZEPINE

Walter Schindler, Riehen, and Armin Zust, Birsfelden, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Nov. 15, 1968, Ser. No. 776,246
Claims priority, application Switzerland, Nov. 30, 1967, 16,874/67; Dec. 29, 1967, 18,372/67
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 TR **7 Claims**

10-(piperazinyl)-and 10-(hexahydrodiazepinyl)-thieno-[3,2-b][1,5]benzothiazepine derivatives and their pharmaceutically acceptable acid addition salts are prepared; these compounds have a depressant effect on the central nervous system; they are the active ingredients of pharmaceutical compositions; an illustrative embodiment is 10-(4-methyl - 1 - piperazinyl) -thieno[3,2-b][1,5]benzothiazepine.

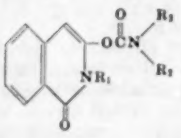
3,641,032

N,N-DISUBSTITUTED 2-ALKYL-3-HYDROXY-1 (2H)-ISOQUINOLONECARBAMATES

Harold Zinnes, Rockaway, John Shavel, Jr., Mendham, and Neil A. Lindo, Chatham, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

No Drawing. Filed June 5, 1969, Ser. No. 830,882
Int. Cl. C07d *35/32*
U.S. Cl. 260—287 **2 Claims**

Immunosuppressive compositions containing compounds of the formula:



(I)

wherein R_1 is alkyl and R_2 is alkyl or aryl. Generally speaking, they are administered at a dose of about 1 mg./kg. to 100 mg./kg. of the animal body weight in order to suppress immuno responses.

3,641,033

4,4' - (LOWER-ALKYLENEDITHIO OR DISULFONYL)-BIS-TETRAHALO PYRIDINES AND DERIVATIVES THEREOF

Leonard Levine, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Feb. 3, 1969, Ser. No. 796,147
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 F **10 Claims**

Substituted bis(halogenated azine) compounds such as 4,4' - (tetramethylenedithio)bis(2,3,5,6 - tetrachloropyridine) or 2,2'-[sulfonylbis(ethylenesulfinyl)]bis(2,3,5,6-tetrachloropyridine) are prepared from haloazines and alkanedithiols. The compounds are useful as pesticides, particularly for the control of plants, including bacteria, fungi and higher plants.

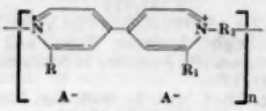
3,641,034

POLYMERS OF DIPYRIDYL

Myron S. Simon, West Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed Sept. 2, 1969, Ser. No. 854,781
Int. Cl. C07d *31/42*
U.S. Cl. 260—296 R **6 Claims**

A new class of polymers is described in which the essential recurring structural unit corresponds to the formula



in which R and R_1 each are hydrogen or methyl, R_2 is either alkylene or R_3-phenylene-R_4 wherein R_3 and R_4 each are alkylene, *n* is at least 2, and A^- is anion.

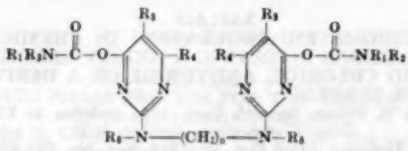
3,641,035

PESTICIDAL COMPOUNDS AND COMPOSITIONS CONTAINING THEM

Nigel Douglas Bishop, Winnersh, and Joan Irene Masters, Crowthorne, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed May 18, 1970, Ser. No. 38,541
Claims priority, application Great Britain, May 28, 1969, 26,922/69
Int. Cl. C07d *51/38*
U.S. Cl. 260—256.4 C **2 Claims**

Bis pyrimidine derivatives having the formula:



wherein R_1, R_2, R_3, R_4 and R_5 are lower alkyl groups, or R_3 and R_4 are hydrogen atoms and *n* is an integer having a value of from 1 to 6, and compositions containing said derivatives to combat pests.

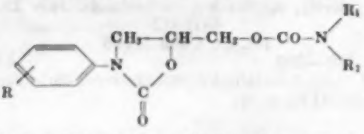
3,641,036

DERIVATIVES OF 5-CARBAMOYLOXYMETHYL-3-SUBSTITUTED - 2-OXAZOLIDINONES, PROCESS OF PREPARATION THEREOF AND THEIR THERAPEUTIC APPLICATION

Claude P. Fauran and Guy M. Raynaud, Paris, René A. Oliver, Vincennes, and Colette A. Douzon, Paris, France, assignors to Delalande S.A., Courbevoie, Hauts-de-Seine, France

No Drawing. Filed Mar. 17, 1970, Ser. No. 20,401
Claims priority, application Great Britain, Mar. 18, 1969, 14,260/69
Int. Cl. C07d *85/28*
U.S. Cl. 260—268 C **2 Claims**

A compound of the formula



in which R is H, halogen, alkyl having 1 to 4 carbon atoms or trifluoromethyl, and R_1 and R_2 each is H or dialkylaminoalkyl or together with N comprise methylpiperazino.

The compound is prepared by treating the corresponding 5-hydroxymethyl compound with ammonia or an amine in the presence of phosgene.

The compounds possess anti-depressive, myorelaxing, tranquilizing, sedative, analgesic, anti-convulsive, anti-pyretic, anti-inflammatory and uricosuric activities.

3,641,037
CYCLIC SUBSTITUTED DERIVATIVES OF TRICYCLOHEXYLTIN
Donald E. Bublitz, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Sept. 20, 1968, Ser. No. 761,309
Int. Cl. C07f 7/22
U.S. Cl. 260—270 **7 Claims**

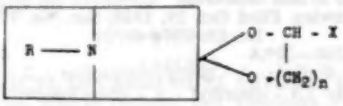
Cyclic substituted derivatives of tricyclohexyltin wherein the cyclic substituent is selected from furyl, pyridyl, indenyl and pyridylethyl, said derivatives being useful as pesticides.

3,641,038
10,11-DIHYDRO - 10,5 - (IMINOMETHANO)-5H-DIBENZO[a,d]CYCLOHEPTEN - 10,01; ACID ADDITION SALTS THEREOF; AND PROCESS
Martin A. Davis, Montreal, Quebec, and Thomas A. Dobson, Dollard Ormeaux, Quebec, Canada, assignors to Ayerst, McKenna & Harrison Limited, St. Laurent, Montreal, Quebec, Canada
No Drawing. Filed Oct. 29, 1968, Ser. No. 771,602
Int. Cl. C07d 39/00
U.S. Cl. 260—289 R **3 Claims**

There is disclosed herein 10,11 - dihydro-10,5-(iminomethano) - 5H-dibenzo[a,d]cyclohepten-10-ol and salts thereof with pharmacologically acceptable acids, a process for preparing said compound, and intermediates used in said process. The compound possesses anti-convulsant activities, and methods for its use are also disclosed.

3,641,039
CYCLIC KETAL DERIVATIVES OF CERTAIN TROPINONES AND NORTROPINONES
Jozsef Rakoczi, Gyula Mikite, Lujza Petocz, Janos Fischer, Katalin Grasser, and Ibolya Kosoczky, Budapest, Hungary, assignors to Egyesult Gyogyszer es Tapszergyar, Budapest, Hungary
No Drawing. Filed Dec. 22, 1969, Ser. No. 887,318
Claims priority, application Hungary, Dec. 29, 1968, EE-1,613
Int. Cl. C07d 43/06
U.S. Cl. 260—292 **7 Claims**

New cyclic ketal derivatives of the Formula I



(I)

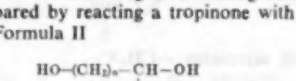
wherein

R represents an alkylene group of 5 to 6 carbon atoms or the residue of an N-substituted nortropane skeleton, wherein the substituent is methyl or ethoxycarbonyl group,

X represents hydrogen, hydroxymethyl, alkoxymethyl, acyloxymethyl, halomethyl, benzoyloxymethyl, carbamoyloxymethyl or piperidino methyl group,

n is an integer between 1 and 4, but if R represents pentamethylene and X is a hydrogen atom, then *n* is 3 or 4, and if R is hexamethylene and X represents a hydroxymethyl group, so is *n* an integer between 2 and 4,

as well as their acid addition salts and the quaternary onium derivatives of the nitrogen-containing compounds have been prepared by reacting a tropinone with a compound of the Formula II

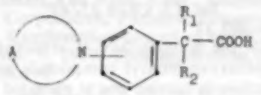


(II)

(wherein *n* has the same meanings as stated above and X' represents a hydrogen, halomethyl or hydroxymethyl group) or with a ketal derivative of the compound of the general Formula II formed with acetone; if a carbamoyl, ether, ester or halo derivative is wanted by carbamoylating, etherifying, esterifying or halogenating the compounds of the Formula I wherein X represents hydroxymethyl group; if a piperidine derivative is wanted, by reacting the compound of the Formula I, wherein X represents halomethyl group, with piperidine or a salt thereof; if a nor-derivative is wanted by reacting the tropinone ketal derivatives with chlorocarbonic acid ethyl ester; and if a salt is wanted, converting the nitrogen-containing compounds of the Formula I into their acid addition salts or quaternary onium derivatives.

3,641,040
TERTIARY AMINO PHENYL ACETIC ACIDS
Richard William James Carney, New Providence, and George de Stevens, Summit, N.J., assignors to Ciba Corporation, Summit, N.J.
No Drawing. Continuation-in-part of application Ser. No. 808,343, Mar. 18, 1969, which is a continuation-in-part of application Ser. No. 790,863, Jan. 13, 1969, which is a continuation-in-part of application Ser. No. 757,136, Sept. 3, 1968, which in turn is a continuation-in-part of application Ser. No. 716,347, Mar. 27, 1968. This application July 18, 1969, Ser. No. 843,244
Int. Cl. C07d 29/24
U.S. Cl. 260—293.72 **4 Claims**

New a-(cyclic tert. aminophenyl)-aliphatic acids, e.g. those of the formula



R_1=H or alkyl

R_2=H, alk(en)yl, cycloalk(en)yl or cycloalk(en)yl-alkyl

A=alk(en)ylene, aza-, oxa, or thiaalkylene

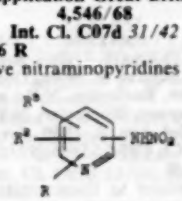
and functional derivatives thereof, are anti-inflammatory agents.

3,641,041
DIPYRIDYLIUM QUATERNARY DIHALIDE HALOGEN COMPLEXES
Robert M. Thomas, Fred R. Gerns, and John L. Sands, West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.
No Drawing. Filed Oct. 23, 1968, Ser. No. 770,082
Int. Cl. C07d 31/42
U.S. Cl. 260—296 T **2 Claims**

Halogen complexes of dipyridylium quaternary dihalide are bacteriocidal and herbicidal agents and are useful as defoliants, particularly as cotton defoliants.

3,641,042
NITRAMINO PYRIDINE DERIVATIVES
Karl Ayad, Wrexham, Wales, assignor to Monsanto Chemicals Limited, London, England
No Drawing. Filed Jan. 28, 1969, Ser. No. 794,783
Claims priority, application Great Britain, Jan. 29, 1968, 4,546/68
Int. Cl. C07d 31/42
U.S. Cl. 260—296 R **4 Claims**

Herbicidal active nitraminopyridines of the formula



or an N-oxide or salt of such a nitraminopyridine base, wherein R is hydrogen or alkyl having from 1 to 6 carbon atoms; R^2 is chlorine, bromine, nitro or alkyl having from 1 to 6 carbon atoms; and R^5 is chlorine, bromine or nitro but different from R^2.

3,641,043

N-(1,3-THIAZOL-2-YL)-DITHIOCARBAMIC ACID DERIVATIVES

Erich Däbritz and Werner Schäfer, Leverkusen, Ferdinand Grewe, Burscheid, and Hans Scheinpflug, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 14, 1969, Ser. No. 799,517
Claims priority, application Germany, Mar. 2, 1968, P 16 70 993.6
Int. Cl. C07d *91/34*
U.S. Cl. 260—306.8 2 Claims

N-(1,3-thiazol-2-yl)-dithiocarbamic acid derivatives, i.e. N-(1,3-thiazol - 2 - yl)-dithiocarbamic acid -alkyl, -alkali metal carboxy-methyl, -carboxy-methyl, -carboalkoxy-methyl, -N'-aminocarbonyl-methyl and -N'-alkylaminocarbonyl-methyl, esters, which possess fungicidal properties and which may be produced by conventional methods.

3,641,044

PROCESS FOR THE MANUFACTURE OF ARYLOXAZOLES

Erich Matter, Basel, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Filed Aug. 20, 1968, Ser. No. 753,893
Claims priority, application Switzerland, Aug. 25, 1967, 11,936/67
Int. Cl. C07d *85/48*
U.S. Cl. 260—307 D 6 Claims

A process for the manufacture of aryloxazoles, starting from ortho-hydroxyaminoaryl compounds and carboxylic acids. The reaction is carried out at elevated temperatures in a diluent, and a tertiary nitrogenous base is initially added to the mixture containing the ortho-hydroxyaminoaryl compound.

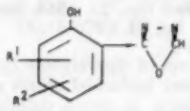
3,641,045

HYDROXY-PHENYL OXADIAZOLES

William H. Meek, Northfield, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

No Drawing. Filed June 11, 1969, Ser. No. 832,429
Int. Cl. C07d *85/54*
U.S. Cl. 260—307 2 Claims

Oxadiazoles of the formula:



wherein R^1 and R^2 are hydrogen, halogen or hydrocarbyl providing that both R's are not hydrogen, and novel hydrazide and formylhydrazide intermediates. The oxadiazoles are useful as bacteria growth inhibitors.

3,641,046

DERIVATIVES OF THIOURAZOLES

John W. Gates, Jr., Albert W. Wise, Dorothy J. Beavers, and Paul E. Miller, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 4, 1969, Ser. No. 813,715
Int. Cl. C07d *55/06, 93/08*
U.S. Cl. 260—308 R 14 Claims

This invention relates to thiourazole adducts formed by reacting an α,β-unsaturated compound with a thiourazole. In one aspect, this invention relates to mono- and di-adducts of thiourazoles and dithiourazoles. In another aspect, this invention relates to thiourazole adducts which have been further reacted through the functional groups on the adduct.

3,641,047

2-NITROIMIDAZOLE DERIVATIVES SUBSTITUTED IN THE 1-POSITION WITH A 2-OXO-PROPYL OR SEMICARBAZONE GROUP

Alden Gamaliel Beaman, North Caldwell, N.J., Robert Duschinsky, Pully-Lausanne, Switzerland, and William Paul Tautz, New York, N.Y., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Division of application Ser. No. 840,077, Apr. 23, 1969, now Patent No. 3,549,653, which is a division of application Ser. No. 556,585, June 10, 1966, now Patent No. 3,468,902, dated Sept. 23, 1969, which in turn is a continuation-in-part of application Ser. No. 447,087, Apr. 9, 1965. This application Aug. 5, 1970, Ser. No. 61,516
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 10 Claims

Antimicrobial 2-nitroimidazole derivatives substituted in the 1-position with a 2-oxo-propyl or semicarbazone group, a 2-propanol group, a 2,3-epoxypropyl group, or derivatives thereof.

3,641,048

ALKYL 1 - (SUBSTITUTED ALKYLIDENEAMINO-OXYCARBONYL) - 2 - BENZIMIDAZOLECARBAMATES

Bruce I. Dittmar, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 29, 1969, Ser. No. 845,869
Int. Cl. C07d *49/38*
U.S. Cl. 260—309.2 4 Claims

A group of alkyl 1 - (substituted alkyldeneaminooxycarbonyl) - 2 - benzimidazolecarbamates are useful as fungicides and mite ovicides. These compounds can be prepared by reacting alkyl 2 - benzimidazolecarbamates with a chloroformate derived from an oxime and phosgene in the presence of an acid acceptor, e.g. triethylamine.

A compound exemplary of the group is methyl 1-[1-methylthio)ethyleneaminooxycarbonyl] - 2 - benzimidazolecarbamate.

3,641,049

IMIDAZOLINE-2-THIONES

Jan Olof Sandstrom, Mataregranden 5, Lund, Sweden, and Per Gunnar Kjellin, Lund, Sweden; said Kjellin assignor to said Sandstrom

No Drawing. Filed Oct. 29, 1968, Ser. No. 771,610
Int. Cl. C07d *49/34*
U.S. Cl. 260—309.6 4 Claims

N,N' - dialkyl - 4 - phenylimidazoline - 2 - thiones, particularly 1,3 - dimethyl - 4 - phenylimidazoline - 2-thione, is disclosed as a useful antidepressant agent. The dimethyl compound also exhibits antiviral properties against herpes simplex and vaccinia viruses.

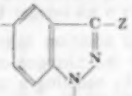
3,641,050

1,5-SUBSTITUTED INDAZOLES

Pasquale Paul Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc.

No Drawing. Filed Dec. 12, 1967, Ser. No. 689,812
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 C 5 Claims

1,5-substituted indazoles having the structural formula



wherein X represents $-CH_2X'$,

$-CH_2OCCH_2X'$, $-CH_2OCSR$, $-CCH_2X'$, $-CSR$, $-CR$, $-C(=NH)NH_3{}^+Cl^-$, $-CH_2CH_2X'$

$-SCX'_3$, or

$-P(=O)(OR)_2$

X′ represents —OH, —OR, —SCN, halogen, or piperidino; R represents an alkyl, haloalkyl, phenyl, or substituted phenyl group; Y represents chlorine, nitro, or amino; and Z represents hydrogen or halogen, are used to control the growth of undesirable fungi, plants, and insects. Among the most active of these compounds as pesticides are N′-hydroxymethyl-5-chloroindazole, 2-(5-chloroindazolylmethyl) thiourea hydrochloride, N′-thiocyanatomethyl-5-nitroindazole, and N′ - trichloromethylmercapto-3,5-dichloroindazole.

3,641,051

NAPHTHYLENE-BIS-2-BENZIMIDAZOLES

Hans Frischkorn, Hofheim, Taunus, Ulrich Pintschovius, Kelkheim, Taunus, Erich Schinzel, Hofheim, Taunus, and Otto Smerz, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 9, 1968, Ser. No. 743,337
Claims priority, application Germany, July 12, 1967. F 52,933
Int. Cl. C07d *49/38*
U.S. Cl. 260—309.2 **14 Claims**

Naphthalene-bis-2-benzimidazoles, especially 1,4-naphthalene-bis-2′-benzimidazoles, are excellent optical brighteners, particularly for fibrous materials, especially for those made of polyacrylonitrile. The new compounds are useful for brightening in combination with oxidative bleaching agents in acid baths.

3,641,052

MONO- AND DI-HALO-1-N-HETEROCYCLOVINYL PHOSPHATES

Robert T. Kemp, Richmond, Va., assignor to Mobil Oil Corporation

No Drawing. Filed Nov. 1, 1968, Ser. No. 772,819
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 R **6 Claims**

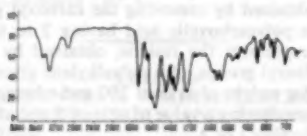
Mono- and di-halovinyl phosphate esters substituted in the 1-position with pyrazolyl or benzopyrazolyl groups and ring-substituted derivatives form a new class of insecticides. They are highly effective against Lepidoptera, particularly the Noctuidae.

3,641,053

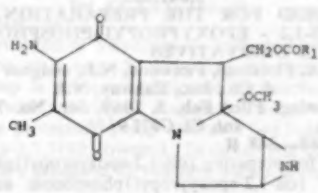
O-ACYL DECARBAMOYL MITOMYCINS

Keizo Uzu, Kinichi Nakano, and Toshinaka Takahashi, Tokyo-to, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed July 8, 1969, Ser. No. 839,923
Claims priority, application Japan, July 23, 1968, 43/51,645
Int. Cl. C07d *27/54*
U.S. Cl. 260—326.3 **7 Claims**



Compounds of the formula



and a process for their preparation are provided wherein R_1 is lower alkyl or substituted lower alkyl. These compounds are antibiotics.

3,641,054

METHOD OF PREPARING 1,4-OXATHIANES AND DERIVATIVES THEREOF

Donald J. Martin, Irvington, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Feb. 4, 1969, Ser. No. 796,569
Int. Cl. C07d *89/14*
U.S. Cl. 260—327 P **10 Claims**

1,4-oxathianes are prepared by reacting a bis(2-haloalkyl) ether with an alkali metal hydrosulfide in an aqueous solution saturated with hydrogen sulfide. The 4-oxide derivatives of 1,4-oxathiane can be prepared by reacting the 1,4-oxathiane with a nitrogen oxide compound at a temperature of from about —20° C. to about 100° C. The 4-oxide can be further reacted with an organic acid anhydride to form dihydro p-oxathiins.

3,641,055

SULFONIUM YLIDS OF ACTIVE METHYLENE COMPOUNDS

John G. Moffatt, Los Altos, Calif., assignor to Syntex Corporation, Panama, Panama

No Drawing. Continuation-in-part of application Ser. No. 621,761, Mar. 9, 1967. This application Feb. 10, 1969, Ser. No. 798,190
Int. Cl. C07d *63/14, 63/16*
U.S. Cl. 260—332.3 R **10 Claims**

Sulfonium ylids, prepared from sulfoxides and compounds possessing an active methylene group, are anti-fungal agents. Their prepaartion is carried out in the presence of an N,N′-disubstituted carbodiimide and an acid.

3,641,056

10-(AMINOMETHYL)- AND (AMINOETHYL)-DIBENZ [b,f]OXEPINS

Walter Schindler, Riehen, and Hans Blattner, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 466,840, June 24, 1965. This application Jan. 6, 1970, Ser. No. 1,063
Int. Cl. C07d *9/00*
U.S. Cl. 260—333 **8 Claims**

10-(aminomethyl)- and 10-(aminoethyl)dibenz[b,f] oxepins such as 10-(dimethylaminomethyl)dibenz[b,f] oxepin, and pharmaceutically acceptable acid addition salts thereof have depressant effects on the central nervous system and are thus useful as sedatives, anticonvulsives and anesthesia potentiators.

3,641,057

4,5-DICHLORO-1,3-DIOXACYCLOPENTENONE

Hans-Dieter Scharf, Wilhelm Droste, and Rita Liebig, Bonn, Germany, assignors to E. Merck Aktiengesellschaft, Darmstadt, Germany

No Drawing. Filed Feb. 3, 1969, Ser. No. 796,200
Claims priority, application Germany, July 2, 1968, P 17 68 801.6
Int. Cl. C07d *13/04, 13/06*
U.S. Cl. 260—340.2 **1 Claim**

The novel compound 4,5-dichloro-1,3-dioxacyclopentenone (dichlorovinylene-carbonate), useful as a stabilizer, a cross linking agent or an intermediate, is produced by reacting tetrachloroethylene carbonate with zinc, copper or copper plated zinc in the presence of catalytic amounts of dimethyl-formamide.

3,641,058
OXIDATION PROCESS EMPLOYING DIPYRIDINIUM DICHROMATE

John R. Corrigan and William M. Coates, Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

No Drawing. Filed July 2, 1969, Ser. No. 838,705
Int. Cl. C07c 47/48, 49/44; C07d 13/00
U.S. Cl. 260—340.5 16 Claims

The present invention provides an improved process for the oxidation of primary and secondary alcohols with dipyridinium dichromate to their respective aldehydes and ketones. An improved process for the preparation of the dipyridinium dichromate oxidizing reagent is also provided.

3,641,059
CYCLIC HYDROXYACETALS

Georg Blumenfeld, Siegiar, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Bezirk Cologne, Germany

Continuation of application Ser. No. 461,557, June 4, 1965. This application Jan. 10, 1969, Ser. No. 802,711
Claims priority, application Germany, June 10, 1964, D 44,647; Jan. 23, 1965, D 46,341
Int. Cl. C07d 15/04, 15/10
U.S. Cl. 260—340.6 6 Claims

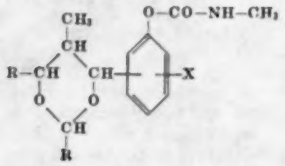
Bis-(hydroxymethylalkyl)dioxanyls are produced by reaction of glyoxalacetals and a trimethanol compound. The dioxanyls can be used in the production of polyesters.

3,641,060
CARBAMATE INSECTICIDE

Michio Nakanishi, Nakatsu-shi, Obita, Ryosuke Kobayashi and Kozo Abe, Fukuoka, and Toshihiko Mukai, Nakatsu-shi, Obita, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

No Drawing. Filed Sept. 25, 1969, Ser. No. 861,146
Claims priority, application Japan, Sept. 28, 1968, 43/70,678
Int. Cl. C07d 13/04
U.S. Cl. 260—340.7 6 Claims

Carbamates of the formula



wherein R is H or methyl and X is H, Cl, methyl or methoxy and insecticidal compositions containing same.

3,641,061
SUBSTITUTED MERCURI CYCLOHEXYL COMPOUNDS

Roger P. Napier, Bridgewater, N.J., and Michael P. Pirnik, Boston, Mass., assignors to Mobil Oil Corporation

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,077
Int. Cl. C07d 13/00; C07f 3/10
U.S. Cl. 260—340.9 6 Claims

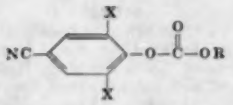
Cyclohexanones and ketals thereof having mercuri substituents in the 2-position and hydroxy, alkoxy, or acetoxy in the 3-position are effective fungicides and bactericides.

3,641,062
CARBONATE ESTERS OF 3,5-DIHALO-4-HYDROXY-BENZONITRILES

Walter Ost, Klaus Thomas, Dietrich Jerchel, and Gerbert Linden, Ingelheim am Rhein, Germany, assignors to C. H. Boehringer Sohn, Ingelheim am Rhein, Germany

No Drawing. Filed Apr. 17, 1969, Ser. No. 817,159
Claims priority, application Austria, Apr. 17, 1968, A 3,744/68
Int. Cl. C07c 121/52; C07d 5/04; A01n 9/20
U.S. Cl. 260—347.4 5 Claims

Herbicidal 4-cyano-2,6-dihalo-phenyl carbonates of the formula



wherein

X is bromine or iodine, and

R is allyl, tetrahydrofurfuryl, phenyl, halophenyl, benzyl, 2,2,2-trichloroethyl or 2-methoxyethyl.

3,641,063
ANTIBIOTIC PURIFICATION PROCESS

Thomas W. Miller, Carteret, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Jan. 22, 1968, Ser. No. 699,376
Int. Cl. C07f 9/38, 9/40
U.S. Cl. 260—348 R 2 Claims

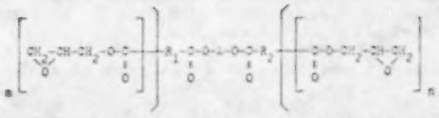
Method for recovering Antibiotic 833A, chemically known as (−)(cis-1,2-epoxypropyl)phosphonic acid, from impure aqueous solutions containing said antibiotic, via adsorption on ion exchange resins with subsequent elution with water, aqueous salt solutions, or aqueous alcoholic salt solutions. Antibiotic 833A is active against both gram-positive and gram-negative bacteria.

3,641,064
POLYGLYCIDYL ESTERS

Alfred Heer, Birsfelden, and Karl Metzger, Aesch, Basel-Land, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,748
Claims priority, application Switzerland, Jan. 29, 1968, 1,311/68
Int. Cl. C07d 1/18
U.S. Cl. 260—348 A 7 Claims

New polyglycidyl esters of formula



wherein R_1 and R_2 independently of each other denotes a residue, obtained by removing the carboxyl groups, of an aromatic polycarboxylic acid having 2 to 6 carboxyl groups, A represents the residue, obtained by removing the two hydroxyl groups, of a polyalkylene glycol or average molecular weight of at least 200 and wherein *m* and *n* denote integers having a value of at least 1 and at most 3, preferably 1 or 2.

3,641,065
METHOD FOR THE PREPARATION OF (CIS-1,2 - EPOXYPROPYL)PHOSPHONIC ACID DERIVATIVES

Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Feb. 3, 1969, Ser. No. 796,177
Int. Cl. C07f 9/38
U.S. Cl. 260—348 R 8 Claims

Method for preparing (cis-1,2-epoxypropyl)phosphonic di-halides, (cis-1,2-epoxypropyl)phosphonic acid esters

and (cis-1,2-epoxypropyl)phosphonic acid salts which comprises treating a [2-hydroxyvinyl]onium halide, methylcarbonate (or methylsulfite) ester with a reagent capable of effecting ring closure wherein the term "onium" includes a radical selected from sulfonium, ammonium, sulfoxonium or phosphonium. The (cis-1,2-epoxypropyl) phosphonic di-halides, (cis-1,2-epoxypropyl)phosphonic acid esters and (cis-1,2-epoxypropyl)phosphonic acid salts thus obtained have utility as intermediates which may be converted to (cis-1,2-epoxypropyl)phosphonic acid. The (cis-1,2-epoxypropyl)phosphonic acid and its salt derivatives are useful as antimicrobial agents and inhibit the growth of gram-positive and gram-negative pathogenic bacteria.

3,641,066

CATALYTIC PROCESS FOR EPOXIDATION OF OLEFINIC COMPOUNDS IN THE PRESENCE OF MOLECULAR OXYGEN

Jean Rouchaud, Brussels, Belgium, and Irénée Seree de Roch, Rueil-Malmaison, France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

No Drawing. Filed Sept. 11, 1969, Ser. No. 857,202
Claims priority, application France, Sept. 16, 1968, 166,397
Int. Cl. C07d *1/08, 1/12*
U.S. Cl. 260—348.5 V **3 Claims**

In the liquid phase catalytic epoxidation of olefins, such as propylene, a novel catalyst is provided, composed of molybdenum, tungsten, or vanadium, or a compound thereof, deposited on a zeolite, such as a molecular sieve of the X type, the pores of the zeolite having a diameter of 6–10 angstroms, the molybdenum, tungsten or vanadium content of said catalyst being between 0.02 and 20% by weight with respect of the weight of the carrier, the catalyst being used in an amount of from 10^{-1} to 10^{-5} gram-atoms of metal per kilogram of feedstock.

3,641,067

EPOXIDATION OF OLEFINS WITH THALLIC CARBOXYLATES

Walter M. Kruse, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,671
Int. Cl. C07d *1/08, 1/12*
U.S. Cl. 260—348.5 L **6 Claims**

The process disclosed is one of oxidizing propylene or isobutylene to the corresponding epoxide. The oxidizing agent is a thallic carboxylate, such as thallic acetate, and the epoxide is obtained as principal product by continuously removing the volatile oxidation reaction products from the reaction mixture as the oxidation proceeds. The oxidation may be carried out at a temperature from about 0° C. to about 170° C.

3,641,068

17α-(2 - ALKYNYL)-7α - METHYLESTRA-1,3,5(10)-TRIENE - 3,17β - DIOLS AND ESTERS CORRESPONDING

Paul D. Klimstra, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed Jan. 31, 1969, Ser. No. 795,702
Int. Cl. C07c *169/08*
U.S. Cl. 260—397.5 **6 Claims**

The conversion of 3-hydroxy-7α-methylestra-1,3,5(10)-trien-17-one to a suitable derivative, wherein the 3-hydroxy group is protected, followed by reaction of that derivative with a 2-alkynyl magnesium halide and cleavage of the protecting group affords 17α-(2-alkynyl)-7α-methylestra-1,3,5(10)-triene-3,17β-diols. The corresponding esters are produced by reaction with a lower alkanoic acid anhydride or halide. These novel compounds are valuable pharmacological agents, e.g. deciduogenic, anti-estrogenic, anti-fertility and pepsin-inhibitory.

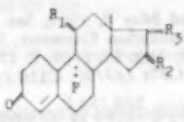
3,641,069

6-FLUORO STEROIDS OF THE ANDROSTANE SERIES

Georg Anner, Basel, and Charles Meystre, Reinach, Basel-Land, Switzerland, assignors to Ciba Corporation, Summit, N.J.

No Drawing. Filed Apr. 29, 1969, Ser. No. 820,332
Claims priority, application Switzerland, May 6, 1968, 6,669/68
Int. Cl. C07c *169/20, 169/22*
U.S. Cl. 260—397.45 **9 Claims**

New 6-fluoro steroids of the androstane series having the Formula I



(I)

in which R_1 represents a free β-positioned hydroxyl group together with hydrogen, or an oxo group, R_2 represents an α- or β-positioned methyl group together with hydrogen, or a methylene group and R_3 a free, esterified or etherified hydroxyl group together with hydrogen, or an oxo group, and their 1-dehydro-derivatives have antiinflammatory activity. They are prepared by methods known in the art.

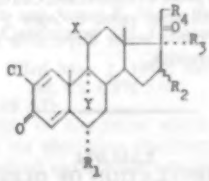
3,641,070

HALOGEN-PREGNADIENES

Georg Anner and Ludwig Ehmann, Basel, Switzerland, assignors to Ciba Corporation, Summit, N.J.

No Drawing. Filed June 25, 1969, Ser. No. 836,601
Claims priority, application Switzerland, June 28, 1968, 9,707/68
Int. Cl. C07c *169/34*
U.S. Cl. 260—397.45 **17 Claims**

The invention concerns compounds of the general formula



wherein

R_1 is H, CH_3 or a halogen atom
R_2 is H or CH_3
R_3 is a free or esterified hydroxyl group
R_4 is a free, esterified or etherified hydroxy group, and
X and Y each represent a halogen atom.

Use: as antiphlogistics.

3,641,071

HYDROCARBOXYLATION REACTION TO FORM STRAIGHT-CHAIN ANHYDRIDES

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed June 11, 1969, Ser. No. 832,414
Int. Cl. C07c *51/14*
U.S. Cl. 260—398 **11 Claims**

A process for the formation of straight-chain carboxylic acid anhydrides comprising contacting an ethylenically

unsaturated hydrocarbon, carbon monoxide and a carboxylic acid with a Group VIII noble metal in complex association with a biphyllic ligand wherein the reaction is performed in a reaction medium containing 10 volume percent of a carboxylic acid anhydride for the entire or, at least, a substantial portion of the reaction period and at a temperature between 100° and 300° C. The presence of the anhydride has been found to increase the yield of straight-chain anhydrides.

3,641,072

PRODUCTION OF SULFITOBETAINES

Harry Distler, Ludwigshafen, and Rudi Widder, Eppelheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed May 8, 1969, Ser. No. 823,160
Claims priority, application Germany, May 10, 1968, P 17 68 407.0; Aug. 14, 1968, P 17 93 191.8
Int. Cl. C07c *143/90;* **C11d** *1/28*
U.S. Cl. 260—401 **9 Claims**

Production of sulfitobetaines by reaction of amines with 1,2-glycol sulfites and the new sulfitobetaines themselves. The new products are valuable starting materials for the production of dyes, detergents, wetting agents, finishes and auxiliaries in the textile dyeing and printing fields, and for the production of pesticides.

3,641,073

TEXTILE TREATING COMPOSITION AND PROCESS OF MAKING SAME

Herman T. Buckley, Columbus, Ga., assignor to Dixie Size and Chemical Co.

No Drawing. Filed Jan. 31, 1969, Ser. No. 795,723
Int. Cl. C07c *69/30;* **C10m** *3/20;* **D06m** *13/20*
U.S. Cl. 260—410.6 **1 Claim**

Liquid textile treating composition and process produced by reacting trimethylolpropane with mixture of fatty acids of 10 to 18 carbon atoms and having average molecular weight from 220 to 285. The mole ratio of trimethylolpropane to the fatty acids ranges from 1:2 to 1:3 and reaction takes place at temperature ranging from 140° C. to 200° C. until acid value is from 5 to 15. The reaction product is made water dispersible and textile material is treated therewith.

3,641,074

CARBONYLATION OF OLEFINS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Continuation-in-part of application Ser. No. 715,169, Mar. 22, 1968. This application Feb. 25, 1969, Ser. No. 802,218
Int. Cl. C11c *3/02*
U.S. Cl. 260—410.9 **13 Claims**

A process for preparation of carboxylic acids, esters or anhydrides having a high ratio of normal to iso compounds comprising contacting an olefin and carbon monoxide with water, an organic acid or an alcohol under liquid phase conditions in the presence of a Group VIII noble metal in complex association with a biphyllic ligand at temperatures between 30° and 300° C. and at pressures sufficient to maintain liquid phase conditions. The catalyst is maintained in a form selective for the formation of normal or straight chained products by performing the reaction in the presence of hydrogen and/or by limiting the mineral acid content of the reaction medium, preferably to an equal molar ratio with the Group VIII noble metal.

3,641,075

PRODUCTION OF ESTERS BY CATALYTIC CONVERSION OF α-ORGANOOXY HYDROPEROXIDES

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed June 16, 1969, Ser. No. 833,795
Int. Cl. C07c *67/00, 73/06*
U.S. Cl. 260—410 **7 Claims**

A process of producing an ester from an ozonized olefin by contacting the ozonized olefin with hydrogen in a liquid medium in the presence of Raney nickel-chromium catalyst.

3,641,076

CATALYST RECOVERY

Frank B. Booth, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Continuation of application Ser. No. 729,886, May 17, 1968. This application Aug. 24, 1970, Ser. No. 66,562
Int. Cl. C07f *15/00, 15/02, 15/04*
U.S. Cl. 260—429 R **21 Claims**

A method for the recovery of complexes of Group VIII metals and biphyllic ligands from hydrocarbons or high boiling residues formed in hydrocarbonylation of olefins. The Group VIII catalyst metal is recovered in accordance by treatment of the high boiling fraction of a hydroformylation reaction medium with a solution of sulfuric, perchloric or low molecular weight alkyl or aryl sulfonic acids at a temperature from about 5° to 125° C. and a pressure from about 1 to 1000 atmospheres, sufficient to maintain liquid phase conditions during the contacting. The presence of a hydrocarbon olefin having from 2 to about 25 carbons in the extraction step enhances the extraction of the Group VIII metal catalyst complex. The Group VIII metal complex can be precipitated from the acid extract phase by dilution with water to lower the acid strength of the extract.

3,641,077

METHOD FOR PREPARING ALKOXY DERIVATIVES OF SILICON, GERMANIUM, TIN, THALLIUM AND ARSENIC

Eugene G. Rochow, Winchester, Mass.

No Drawing. Filed Sept. 1, 1970, Ser. No. 68,763
Int. Cl. C07f *7/00, 7/02, 7/22*
U.S. Cl. 260—429 R **15 Claims**

The invention provides a method for preparing organic metal compounds of the metals germanium, tin, thallium, arsenic and more particularly of silicon and comprises introducing an alcohol, such as methanol, ethanol, n-propanol, and iso-butanol, slowly below the surface of a suspension in silicone oil of a finely divided mixture of one of the above metals and catalyst, such as copper, containing about 9 parts by weight of the selected metal and about 1 part by weight of catalyst while heating the suspension at a temperature between about 250° C. and about 300° C. to cause the alcohol to react with the selected metal to form an organic metal compound in vapor form which is condensed and collected, the desired organic metal compound being isolated by fractional distillation of the condensate.

3,641,078

METHOD FOR PREPARING BIS(ALKYLDIPHENYL TIN) SULFIDE

Gerrit Johann Meine van der Kerk, Utrecht, and Albert Tempel, Van Houtenlaan, Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Apr. 23, 1969, Ser. No. 818,777
Claims priority, application Netherlands, Apr. 25, 1968, 6805920
Int. Cl. C07f *7/22;* **A01n** *9/12*
U.S. Cl. 260—429.7 **4 Claims**

Bis(alkyldiphenyl tin) sulfides, method of preparing same, fungicidal compositions which contain these com-

pounds as the active constituent and method of preparing the said compositions.

3,641,079
PROCESS FOR THE MANUFACTURE OF TITANIC ESTERS

Eric Termin, Niederkassel, and Rosbdy Ismail, Spich, Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Filed Mar. 25, 1969, Ser. No. 810,269
Claims priority, application Germany, Mar. 28, 1968, P 17 68 066.9
Int. Cl. C07f *7/28*
U.S. Cl. 260—429.5 **16 Claims**

Manufacture of titanic esters from titanic halides and unsubstituted or aryl-substituted aliphatic hydroxy compounds, cycloaliphatic hydroxy compounds, or unsubstituted or alkyl-substituted aromatic hydroxy compounds performed in the presence of catalytic quantities of tertiary amines, whose amino group may or may not be a component of an aromatic ring system, and/or in the presence of unsubstituted or N-monosubstituted or N-disubstituted acid amides, with the use of solvents if desired, at temperatures of 50 to 250° C., preferably 50 to 200° C.

3,641,080
PROCESS FOR PREPARING DIALKYLIZINC COMPOUNDS FROM ALKYLBROMIDE AND ALKYLIODIDE

Schrade F. Radtke, New Canaan, Conn., assignor to International Lead Zinc Research Organization Inc., New York, N.Y.

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,845
Int. Cl. C07f *3/06*
U.S. Cl. 260—429.9 **13 Claims**

A direct process for preparing dialkylzinc compounds, wherein zinc alloyed with sodium, potassium or lithium is reacted with a mixture of alkylbromide and alkyliodide in the absence of moisture to produce a dialkylzinc compound.

3,641,081
PROCESS FOR PREPARING DIALKYLZINC COMPOUNDS FROM ALKYLBROMIDE

Schrade F. Radtke, New Canaan, Conn., assignor to International Lead Zinc Research Organization Inc., New York, N.Y.

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,852
Int. Cl. C07f *3/06*
U.S. Cl. 260—429.9 **12 Claims**

A direct process for preparing dialkylzinc compounds, wherein zinc alloyed with sodium, potassium or lithium is reacted with alkylbromide in the absence of moisture to produce a dialkylzinc compound.

3,641,082
PROCESS FOR THE ALKYLATION, ALKENYLATION OR ARYLATION OF HEAVY-METAL SALTS BY MEANS OF ORGANO-TRIPTYCH-SILOXAZOLIDINES

Richard Müller, Radebeul, Hans Frey, Dresden, and Christian Dathe, Radebeul, Germany, assignors to Institut fur Silikon- und Fluorkarbon-Chemie, Radebeul, Germany

No Drawing. Filed Feb. 17, 1969, Ser. No. 799,959
Int. Cl. C07f *3/10, 7/24, 7/94*
U.S. Cl. 260—431 **13 Claims**

Process for the alkylation, alkenylation or arylation of salts or hydroxides of heavy metals, such as mercury, bismuth, antimony and lead, comprising reacting them with organo-triptych-siloxazolidines in the presence of fluorine. The products according to this invention are useful as pharmaceuticals and pesticides, and may also serve in the synthesis of other useful products.

3,641,083
CHROMIUM COMPLEXES OF FLUOROISOALKOXYALKYL CARBOXYLIC ACIDS

Louis G. Anello, Basking Ridge, Edward Michael Boghosian, Fort Lee, Edward S. Jones, Whippany, Pritam S. Minhas, Morris Plains, Alson K. Price, Morristown, and Richard F. Sweeney, Randolph Township, Dover, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Nov. 1, 1968, Ser. No. 772,831
Int. Cl. C11c *3/00;* **C07f** *11/00*
U.S. Cl. 260—438.5 C **14 Claims**

Chromium complexes of fluorocarbon carboxylic acids characterized by having a polyfluoroisoalkoxyalkyl tail wherein an ether oxygen links a fluorinated carbon atom connected to two fluoroalkyl groups and a $-CF_2CF_2-$ group. These chromium complexes are useful to impart oil and water resistance to various substrates including paper, leather, and the like.

3,641,084
VINYLIC ALUMINACYCLOALKANE COMPOUNDS AND THEIR PREPARATION

Lawrence H. Shepherd, Jr., Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed May 5, 1969, Ser. No. 821,954
Int. Cl. C07f *5/06*
U.S. Cl. 260—448 A **46 Claims**

Organoluminum compounds possessing a vinylic alumina-cycloalkane moiety are described. These are prepared by reacting a nonionic organoaluminum compound possessing an aluminacyclo-alkene moiety with an olefinic reactant in the presence of a stable Lewis base. The compound possessing the aluminacycloalkene moiety may be used in preformed condition or it may be formed in situ during the course of a one-step reaction. The compounds possessing the vinylic aluminacycloalkane moiety yield alpha-olefinic compounds on hydrolysis.

3,641,085
OXIDATION OF ALUMINUM ALKYLS

Allan J. Lundeen and James F. Yates, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed May 1, 1969, Ser. No. 821,073
Int. Cl. C07f *5/06*
U.S. Cl. 260—448 AD **5 Claims**

In the oxidation of aluminum alkyls in the preparation of alcohols via aluminum chemistry, higher quality and yields of desired alcohol are obtained if the rate of oxidation is materially reduced when the oxygen in the oxidation reactor approaches the maximum allowable and continuing the oxidation to substantial completion at the lower rate of oxygen flow.

3,641,086
PROCESS FOR CONVERTING TRIALKYL ALUMINUMS TO ALUMINUM ALKOXIDES

Russell G. Hay, Gibsonia, and John G. McNulty and William L. Walsh, Glenshaw, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Nov. 17, 1969, Ser. No. 877,422
Int. Cl. C07f *5/06*
U.S. Cl. 260—448 AD **10 Claims**

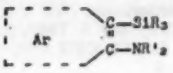
A process for converting a trialkylaluminum compound to an aluminum alkoxide while inhibiting the formation of hydrocarbons which involves oxidizing the trialkylaluminum compound and adding a secondary alcohol to the reaction mixture during the latter stages of oxidation.

3,641,087
PREPARATION OF BROMINATED SILANE DERIVATIVES
Donald John Holman, Wedhey, Harlow, England, assignor to Berk Limited
No Drawing. Filed Oct. 4, 1968, Ser. No. 765,005
Claims priority, application Great Britain, Oct. 18, 1967, 47,455/67
Int. Cl. C07f 7/06, 7/18
U.S. Cl. 260—448.8 R 6 Claims

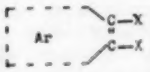
This invention is concerned with the preparation of certain brominated silane derivatives which have a variety of useful properties including, in particular, the ability to impart fire retardant properties to synthetic polymer compositions in which they are incorporated.

3,641,088
AROMATIC o-TRIORGANOSILYL-DIORGANOAMINO COMPOUNDS AND PROCESS
Walter Fink, Ruschlikon/ZH, Nidelbadstr. 99, Zurich, Switzerland
No Drawing. Filed Feb. 20, 1969, Ser. No. 801,178
Int. Cl. C07f 7/10
U.S. Cl. 260—448.2 N 7 Claims

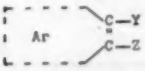
Aromatic o-triorganosilyl-diorganoamino compounds of the formula



where Ar is aromatic and process for making by reacting a compound of the formula



where X is halogen and a lithium alkyl, or a compound of the formula



where Y and Z are cleavable atoms or groups, in an inert solvent and in an inert atmosphere with a compound of the formula $R_3SiNR'_2$. The novel compounds are useful for the preparation of dyes of the triphenylmethane series.

3,641,089
SILOXAZANES COMPOSITIONS AND PROCESSES THEREOF
Richard P. Bush, Penarth, Glamorgan, Wales, assignor to Midland Silicones Limited, Reading, England
No Drawing. Filed Mar. 24, 1969, Ser. No. 809,950
Claims priority, application United Kingdom, Mar. 29, 1968, 15,282/68
Int. Cl. C07f 7/02
U.S. Cl. 260—448.2 N 12 Claims

This disclosure relates to various cyclic siloxazane compounds and to processes thereof. These cyclic siloxazane compounds are prepared by reacting certain siloxazanes with hydrocarbon lithium compounds; useful cyclic materials are obtained containing one or two lithium atoms attached to nitrogen atoms in the cyclic structure.

3,641,090
SILANOLATE-COMPLEXES AND USE THEREOF
Edgar E. Bostick, Scotia, and Joseph J. Zdaniewski, Schenectady, N.Y., assignors to General Electric Company
No Drawing. Filed Oct. 13, 1969, Ser. No. 866,003
Int. Cl. C07f 7/02
U.S. Cl. 260—448.2 N 3 Claims

Hexamethylphosphoramide-complexes of alkali metal silanolates are provided, and a method for making these materials. These alkali metal silanolate-complexes can be used as polymerization initiators for the preparation of organopolysiloxanes and organopolysiloxane block polymers.

3,641,091
METHOD OF PREPARING DISUBSTITUTED DI(p-ARYLAMINOPHENOXY) SILANES
Leonid Alexandrovich Skripko, Ulitsa Michurinskaya 143, kv. 97, Tambov, U.S.S.R.; Eduard Grigorievich Rozantsev, 2 Baltysky pereulok 2, kv. 10, Moscow, U.S.S.R.; and Lidia Grigorievna Polotovskaya, Poselok khiminstituta 10, kv. 15, Kalinin, U.S.S.R.
No Drawing. Filed Nov. 18, 1970, Ser. No. 90,868
Int. Cl. C07f 7/04, 7/18
U.S. Cl. 260—448.8 R 9 Claims

A method of preparing disubstituted di(p-arylaminophenoxy)silanes by the reaction of p-hydroxyarylamines with disubstituted dichlorosilanes in an inert organic solvent medium and subsequent reaction with ammonia which acts as an acceptor of hydrogen chloride which is given off during the reaction.

Disubstituted di(p-arylaminophenoxy)silanes are effective stabilizers for polypropylene, impact resistant polystyrene, polyamides, homopolymers and copolymers of formaldehyde, polyolefines, a copolymer of tetrahydrofurane and propylene oxide and pentaplast.

3,641,092
ISOCYANATE SYNTHESIS FROM AMINES AND CARBON MONOXIDE CATALYZED BY $PdCl_2$
Patrick M. Henry, McDaniel Crest, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
No Drawing. Filed Nov. 25, 1966, Ser. No. 596,799
Int. Cl. C07c 119/04
U.S. Cl. 260—453 PC 6 Claims

The $—NH_2$ group in an organic amine is converted into a —NCO group by reacting the organic amine with CO in contact with palladium chloride.

3,641,093
STABLE LIQUID DIPHENYLMETHANE DIISOCYANATES
Martin Frederick Brooks and Vincent Kerrigan, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Nov. 4, 1968, Ser. No. 773,338
Claims priority, application Great Britain, Dec. 12, 1967, 56,498/67
Int. Cl. C07c 119/04; C08g 22/26
U.S. Cl. 260—453 AR 2 Claims

Polyisocyanate compositions comprising a diphenylmethane diisocyanate in which from 1% to 50% of the isocyanate groups have been reacted with a non-sterically hindered aromatic carbodiimide other than a carbodiimide derived from diphenylmethane diisocyanate.

3,641,094
PREPARATION OF ISOCYANATES
Dieter Arlt, Cologne-Buchheim, and Volkmar Handschuh, Burscheid, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Mar. 11, 1969, Ser. No. 806,276
Claims priority, application Germany, Mar. 12, 1968, P 16 68 109.7; Nov. 15, 1968, P 18 09 173.1
Int. Cl. C07c 119/04
U.S. Cl. 260—453 PH 8 Claims

Isocyanates are prepared by a process in which the primary amine is reacted with phosgene in the presence of an aqueous solution of an inorganic base and a hydrophobic

inert organic solvent, preferably where the reaction of the primary amine and phosgene takes place in a time of less than one minute.

3,641,095

BONDED LOW-ALUMINA MORDENITE

Joseph R. Kiovsky, Kent, Ohio, and Ronald K. Bart, Sterling Junction, Mass., assignors to Norton Company, Worcester, Mass.

No Drawing. Filed Oct. 29, 1969, Ser. No. 872,408

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 Z **1 Claim**

Natural or synthetic mordenite from which alumina has been removed to give silica to alumina ratio of 20/1 and higher is bonded into agglomerates for catalytic purposes by employing attapulgite type clays to which colloidal silica, in water dispersion stabilized with ammonium ions, is added.

3,641,096

THERMACTIVATION OF CATALYSTS COMPRISING RHENIUM AND CRYSTALLINE ZEOLITIC MOLECULAR SIEVE PARTICLES DISPERSED IN A GEL MATRIX, AND CATALYSTS SO THERMACTIVATED

Joseph Jaffe, Berkeley, and James R. Kittrell, El Cerrito, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of application Ser. No. 753,222, Aug. 16, 1968. This application Sept. 20, 1968, Ser. No. 761,308

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 Z **5 Claims**

Method of activating a catalyst composite comprising a crystalline zeolitic molecular sieve, a gel matrix comprising silica-alumina, and a rhenium or rhenium compound hydrogenating component, said molecular sieve being in particulate form and being dispersed in said gel matrix, which method comprises heating said catalyst composite in an oxygen-containing gas stream at 1200° to 1600° F. for 0.25 to 48 hours, and the catalyst composite so activated.

3,641,097

PREPARATION OF PHENYLALANINE DERIVATIVES AND NOVEL INTERMEDIATES

Balthasar Hegedüs, Binningen, and Paul Zeller, Allschwil, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

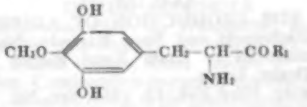
No Drawing. Continuation-in-part of application Ser. No. 684,623, Nov. 21, 1967. This application Oct. 30, 1968, Ser. No. 772,048

Claims priority, application Switzerland, Feb. 9, 1968, 1,971/68

Int. Cl. C07c *137/00*

U.S. Cl. 260—456 A **3 Claims**

The present disclosure relates to methods for the preparation of compounds of the formula



in which R_1 is hydroxyl, alkoxy, or a substituted or unsubstituted amino group, optical isomers (preferably the L-antipodes) thereof and pharmaceutically acceptable salts thereof. Such compounds are useful as hypotensive agents. The instant disclosure also includes certain novel intermediates which are useful in the preparation of the pharmaceutically useful compounds of Formula I.

3,641,098

CYANO SUBSTITUTED PHENYLHYDRAZONES OF 1,2-DICARBONYL COMPOUNDS

Karl-Heinz Buchel and Wilfried Draber, Leverkusen, Ingeborg Hammann, Cologne, and Gunter Untersteinhofer, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Sept. 24, 1968, Ser. No. 762,155

Claims priority, application Germany, Sept. 26, 1967, P 16 68 225.4

Int. Cl. C07c *133/00*

U.S. Cl. 260—465 **6 Claims**

α-(Halo, cyano, nitro and azido)-α-(alkanoyl, carboalkoxy [i.e. alkoxy carbonyl], amino and mono- and dialkyl amino)-carbonyl-(unsubstituted and mono to penta alkyl and/or electronegative substituent [e.g. halo, nitro, cyano, trifluoromethyl, trifluoromethyl-, -mercapto, -sulfonyl and -sulfoxyl, alkoxy, alkyl sulfonyl and/or dimethylmino sulfonyl]-substituted) phenyl hydrazones and their corresponding alkali metal, alkaline earth metal and amine salts, which possess pesticidal, especially acaricidal and insecticidal, properties and which may be produced by conventional methods.

3,641,099

3-HYDROCARBYLOXYNITRILE SYNTHESIS

Ralph P. Williams, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Aug. 6, 1968, Ser. No. 771,375

Int. Cl. C07c *121/14, 121/46*

U.S. Cl. 260—465.6 **3 Claims**

Novel 3-hydrocarbyloxyalkanenitriles are produced by contacting, under anhydrous reaction conditions, a 2-(dihydrocarbyloxyphosphinyl)alkanenitrile, a ketone or aldehyde, and hydrocarbyloxy alkali metal compound, which products are useful as insecticides.

3,641,100

PROCESS FOR THE MANUFACTURE OF ACRYLONITRILE

Keisho Yamada, Shigeki Nagai, Kyoji Odan, Yasuo Nakamura, and Mikio Hidaka, Ube-shi, Japan, assignors to Ube Industries, Ltd., Yamaguchi-ken, Japan

No Drawing. Filed Mar. 5, 1969, Ser. No. 804,656

Claims priority, application Japan, July 2, 1968, 43/45,614; July 12, 1968, 43/48,414

Int. Cl. C07c *121/02*

U.S. Cl. 260—465.3 **1 Claim**

In the process of manufacturing acrylonitrile wherein propylene, ammonia and oxygen are contacted with a solid oxidizing catalyst in the vapor phase at a temperature in the range of 400–600° C., the improved method which comprises using as said solid catalyst a catalyst which consists essentially of

(A) a bismuth antimonate in which the atomic ratio of bismuth to antimony is 1:1, and

(B) a salt of bismuth selected from the group consisting of a bismuth molybdate in which the atomic ratio of bismuth to molybdenum is 2:3, and a bismuth tungstate in which the atomic ratio of bismuth to tungsten is 2:3;

the weight ratio of said bismuth antimonate to said bismuth molybdate or bismuth tungstate being in the range of 95:5–50:50.

3,641,101

PROCESS FOR THE MANUFACTURE OF ACRYLONITRILE BY AMMOXIDATION OF PROPYLENE

Keisho Yamada, Shigeki Nagai, Kyoji Odan Yasutaka, Arima, and Mikio Hidaka, Ube-shi, Japan, assignors to Ube Industries, Ltd., Yamaguchi-ken, Japan

No Drawing. Filed Apr. 17, 1969, Ser. No. 817,191
Claims priority, application Japan, Sept. 3, 1968, 43/62,785
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.3 1 Claim

In the process of manufacturing acrylonitrile by contacting propylene, ammonia and oxygen with a solid oxidizing catalyst in the vapor phase at a temperature of 350–500° C., the improvement wherein said solid oxidizing catalyst consists essentially of

(A) a solid solution of antimony oxide and stannic oxide wherein the atomic ratio expressed in percentage of the antimony and tin is within the range of Sb=70–30% and Sn=30–70%, and

(B) an oxide of a metal selected from the group consisting if indium, iridium and ruthenium;

the weight ratio of solid solution (A) to said metal oxide (B) being within the range 98:2–80:20.

3,641,102

CATALYTIC PROCESS FOR THE AMMONOXYDATION OF OLEFINS

Philippe Reulet, Morenx, and Alain Pfister, Jacques Tellier, and Jean-Henry Blanc, Pau, France, and Kirsten Borre Jorgensen, Holte, and Hans Bohlbro, Lingby, Denmark, assignors to Société Nationale des Petroles d'Aquitaine Tour Aquitaine, Courbevoie, France

No Drawing. Filed Mar. 4, 1969, Ser. No. 804,286
Claims priority, application France, Mar. 5, 1968, 142,447
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.3 10 Claims

The known method of preparing olefinic nitriles by oxidizing a gaseous mixture of olefin with ammonia, over a catalyst containing Mo and Te oxides, has been improved by selecting a catalytically active material which consists of a combination of 1 mole MoO_3 with 10 to 0.1 moles TeO_3 and 0.1 to 1 mole Fe_2O_3, and preferably with 0.35 to 0.14 mole TeO_3 and 0.14 to 0.2 mole Fe_2O_3. The improved method is particularly suitable for the production of acrylonitrile by the ammonoxidation of propylene, and allows one to reach yields of more than 70% with respect to the olefin used, when the temperature, normally of 300° to 600° C., is kept within the narrower limits of 380° to 450°, the duration of contact between reacting gases and catalyst is 3 to 10 seconds, and the gaseous mixture contains by volume 1 to 15% of propylene, 1 to 15% of ammonia and 2 to 14% of oxygen, the balance being nitrogen and/or steam.

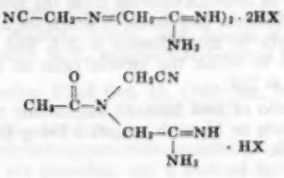
3,641,103

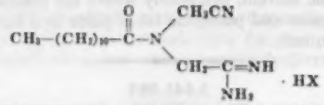
PROCESS FOR PREPARING AMIDINE SALTS

Patricia M. Scanlon, Arlington, Mass., and Elwyn Richard Young, Nashua, N.H., assignors to W. R. Grace & Co., New York, N.Y.

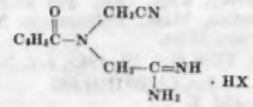
No Drawing. Filed June 3, 1969, Ser. No. 830,091
Int. Cl. C07c *121/00*
U.S. Cl. 260—465.4 5 Claims

An amidine salt having a formula selected from the group consisting of



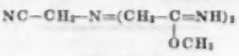


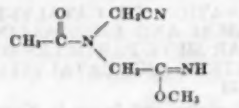
and

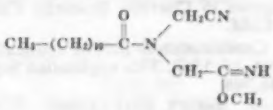


in which X is a bromide or chloride ion and to a method for preparing such salt, all as recited hereinafter.

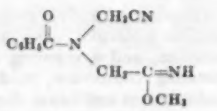
In abstract, this invention is also directed to an imidoether having a formula selected from the group consisting of







and



and to a method for preparing such ether; the amidine salts are useful stabilizers for polyesters.

3,641,104

CYANO SUBSTITUTED PERFLUOROVINYL ETHERS

Daniel Gustav Anderson, Parkersburg, W. Va., Edward Karcher Gladding, Wilmington, Del., and Raymond Sullivan, Altadena, Calif., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 527,725, Feb. 16, 1966. This application Sept. 30, 1968, Ser. No. 763,954
Int. Cl. C07c *121/30*
U.S. Cl. 260—465.6 2 Claims

Substituted perfluorovinyl ethers having the formula $CF_2{=}CF{-}O{-}(CF_2)_n{-}CN$ where n is from 2 to 12, preferably 2 to 4. Specific utilities include employment as cure-site comonomers in copolymers with other ethylenically unsaturated monomers.

3,641,105

PROCESS FOR PRODUCTION OF ADIPONITRILE

Yasuhisa Hashiguchi and Sueo Kamada, Nobeoka-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed Feb. 13, 1969, Ser. No. 799,096
Claims priority, application Japan, Mar. 26, 1968, 43/19,184
Int. Cl. C07c *121/26*
U.S. Cl. 260—465.8 A 6 Claims

A process of producing adiponitrile with excellent yield by using a reacting liquid containing organic halides in order to oppress the side reaction in cyanoethylation

when the acrylonitrile is going to be reduced and dimerized by the amalgam of alkaline metal or amalgam of alkaline earth metal in a water soluble organic solvent.

3,641,106

PROCESS FOR THE CATALYTIC DIMERIZATION OF ACRYLONITRILE

David Arthur Cornforth, Dhafir Yusuf Waddan, and Derek Williams, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Continuation-in-part of application Ser. No. 627,680, Apr. 3, 1967. This application Mar. 3, 1969, Ser. No. 803,963

Int. Cl. C07c *121/20, 121/26, 121/30*

U.S. Cl. 260—465.8 **5 Claims**

A process for the dimerization of acrylonitrile which comprises contacting acrylonitrile with a catalyst consisting essentially of (a) a salt or complex of a metal selected from copper, cobalt, nickel, chromium, iron, titanium and vanadium and (b) an aluminum compound having at least one alkyl group of 1–4 carbon atoms directly attached to the aluminum atom, said aluminum atom carrying in addition two other atoms or groups selected from alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, hydrogen, chlorine and bromine.

3,641,107

PURIFICATION PROCESS FOR UNSATURATED ORGANIC NITRILES

Ernest J. Breda, Beaumont, Tex., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 21, 1968, Ser. No. 769,416

Int. Cl. C07c *121/30, 121/32*

U.S. Cl. 260—465.9 **10 Claims**

Unsaturated organic nitriles containing ionizable cyanide impurities are freed from the cyanide impurities by intimately contacting the nitrile with nitrogen base selected from the group consisting of tertiary amines, quaternary ammonium hydroxides and mixtures thereof and distilling off the purified nitrile.

3,641,108

PROPARGYL ESTERS OF BICYCLO[2.2.1]HEPT-5-ENE-2-CARBOXYLIC ACID AND BICYCLO[2.2.1] HEPTANE-2-CARBOXYLIC ACID

Robert L. Roudabush and Linwood E. Drummond, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 26, 1969, Ser. No. 836,955

Int. Cl. C07c *69/74*

U.S. Cl. 260—468 B **9 Claims**

Propargyl esters of bicyclo[2.2.1]hept-5-ene-2-carboxylic acid or bicyclo[2.2.1]heptane-2-carboxylic acid are obtained by esterification of the acid with propargyl alcohol. The esters are useful as bactericides and fungicides.

3,641,109

ALKYL AND ARYL ESTERS OF POLYHALODITHIO ALCOHOLS

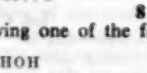
Carl D. Emerson, 4940 W. Winchester, Kansas City, Mo. 64129, and Paul C. Aichenegg, 4232 W. 73rd Terrace, Prairie Village, Kans. 66208

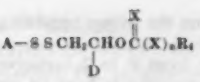
No Drawing. Continuation-in-part of application Ser. No. 560,125, June 24, 1966. This application Sept. 4, 1968, Ser. No. 757,487

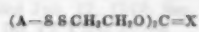
Int. Cl. C07c *69/76*

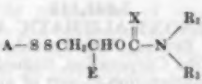
U.S. Cl. 260—473 G **8 Claims**

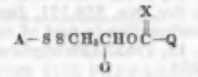
Compounds are prepared having one of the formulae

(1) 

(2) 

(3) 

(4) 

(5) 

and

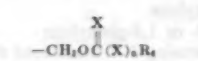
(6)

where:

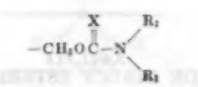
A is selected from the group consisting of di to tetrahaloethyl and di to trihalovinyl;

B is selected from the group consisting of hydrogen and $-CH_2OH$;

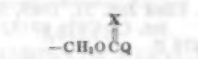
D is selected from the group consisting of hydrogen and



E is selected from the group consisting of hydrogen and



G is selected from the group consisting of hydrogen and



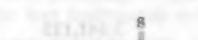
n is 0 or 1,

X is selected from the group consisting of oxygen and sulfur except that when *n* is 0 in Formula 2 X must be oxygen;

Q is halogen;

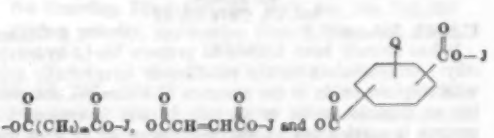
R_1 is selected from the group consisting of alkyl, phenyl, lower alkyl phenyl, halo lower alkyl, halophenyl, naphthyl, lower alkyl naphthyl and lower alkyl halophenyl;

R_2 and R_3 individually are the same as R_1 or hydrogen with the proviso that not more than one of R_2 and R_3 is hydrogen and collectively together with the adjacent nitrogen atom form a 5 to 6 membered heterocyclic ring having up to 1 oxygen therein;



or phenyl ethylene or halophenoxymethyl having up to 3 halogens and up to 1 methyl group on the aromatic ring;

K is selected from the group consisting of



J is selected from the group consisting of hydrogen and $ASSCH_2CH_2$—;

m is an integer from 0 to 2 inclusive, and all halogen atoms in the compounds have an atomic weight of 35 to 80.

3,641,110

PHENOXY-ALIPHATIC ACIDS

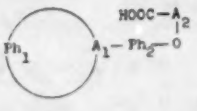
William Laszlo Bencze, New Providence, N.J., assignor to Ciba Corporation, Summit, N.J.

No Drawing. Continuation-in-part of application Ser. No. 728,871, May 14, 1968, which is a continuation-in-part of application Ser. No. 558,251, June 17, 1966, which in turn is a continuation-in-part of application Ser. No. 323,868, Nov. 15, 1963. This application Jan. 29, 1969, Ser. No. 795,029

Int. Cl. C07c *65/114, 69/76, 103/22*

U.S. Cl. 260—473 G 33 Claims

Phenoxy-aliphatic acids, e.g. those of the formula



Ph_1=a 1,2-phenylene

Ph_2=a 1,2-, 1,3- or 1,4-phenylene

A_1=alkylene forming 5–7 membered ring

A_2=aliphatic hydrocarbon radical

and functional derivates thereof are hypocholesterolemic agents.

3,641,111

PROCESS FOR DIRECT ESTERIFICATION OF TEREPHTHALIC ACID WITH AN ALKYLENE GLYCOL

Stanley D. Lazarus, Petersburg, Pa., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Jan. 31, 1969, Ser. No. 795,742

Int. Cl. C07c *69/82*

U.S. Cl. 260—475 P 19 Claims

Direct esterification of terephthalic acid and an alkylene glycol is expedited by forming a fine dispersion of the ingredients aided by a dispersing and wetting agent. The esterification reaction can be carried out in the presence of a small quantity of a solvent which causes successive quantities of acid to enter the liquid phase and to react to form molten esters which then increase the total quantity of liquid phase present in the mixture. This process enables the esterification reaction to be carried out practically at atmospheric pressure or to be carried out at super atmospheric pressure in a shorter time span than is the case in esterification processes heretofore available.

3,641,112

PROCESS FOR THE PREPARATION OF BIS-(β-HYDROXYALKYL) ESTERS OF AROMATIC DICARBOXYLIC ACIDS

Yataro Ichikawa and Yoshiyuki Yamanaka, Yamaguchi-ken, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Filed May 26, 1969, Ser. No. 827,963

Claims priority, application Japan, May 30, 1968, 43/37,024

Int. Cl. C07c *69/82*

U.S. Cl. 260—475 P 8 Claims

It has already been known to prepare bis-(β-hydroxyethyl) terephthalate by the reaction of terephthalic acid with ethylene oxide in the presence of a catalyst comprising an organic amine or its salt. In this invention, the process is carried out in the co-presence of at least one iron compound as a promotor. Thus, a catalyst system of very high activity is provided, and the reaction can be performed at a relatively low temperature with a high conversion of terephthalic acid.

3,641,113

PROCESS FOR THE MANUFACTURE OF VINYL ACETATE

Hans Fernholz, Fischbach, Taunus, and Gunter Jacobsen, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Jan. 29, 1968, Ser. No. 701,111

Claims priority, application Germany, Feb. 4, 1967, F 51,441

Int. Cl. C07c *67/04*

U.S. Cl. 260—497 A 6 Claims

Preparation of vinyl acetate from ethylene, acetic acid and oxygen in the presence of palladium acetate in the liquid phase at 60 to 180° C. and 5 to 100 atmospheres pressure in the presence of 1 to 20 moles, calculated on 1 gram atom of palladium, of a pyridine base.

3,641,114

2-LOWER ALKANOYLOXY-N-SULFONYL-BENZAMIDES

Scott J. Childress, Philadelphia, and J Lester Szabo, West Chester, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 3, 1969, Ser. No. 830,119

Int. Cl. C07c *143/06, 143/28, 143/40*

U.S. Cl. 260—479 R 3 Claims

This invention concerns 2-carb(lower)acyloxy-N-sulfonylbenzamide derivatives thereof which have demonstrated pharmacological activity as central nervous system depressants and are also substantially non-irritating to the gastrointestinal tract upon oral administration.

3,641,115

METHOD FOR PRODUCING ESTERS OF POLYCYCLIC COMPOUNDS

David W. Peck, Charleston, and Robert R. Gentry, St. Albans, W. Va., assignors to Union Carbide Corporation

No Drawing. Filed Aug. 22, 1968, Ser. No. 754,735

Int. Cl. C07c *69/76*

U.S. Cl. 260—475 SC 9 Claims

A method for producing esters of carboxyalkylfluorenes, carboxylalkylcarbazoles, carboxyalkylindenes and carboxyalkylindoles by the rapid catalytic reaction of an acrylate ester and a fluorene, carbazole, indene or indole is described. The catalysts are basic catalysts and the reaction proceeds only when the reactants are in contact with a catalytic amount of the basic catalyst and the reactants are rapidly admixed together.

3,641,116

HARDENERS FOR WATER-SOLUBLE POLYMERS

Alfred Froehlich, Marly-le-Grand, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Filed Sept. 6, 1968, Ser. No. 758,135

Claims priority, application Switzerland, Sept. 27, 1967, 13,484/67

Int. Cl. C07c *125/06*

U.S. Cl. 260—482 B 6 Claims

Compounds containing at least three carboxylic acid amide groups that may be used as hardening agents for water-soluble polymers, especially gelatine.

3,641,117

PRODUCTION OF 2,2-DIMETHYL-1,3-PROPANE-DIOLMONO(HYDROXYPIVALATE)

Rolf Platz, Mannheim, and Franz Merger, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Aug. 21, 1968, Ser. No. 754,484
Claims priority, application Germany, Aug. 25, 1967, P 16 43 650.3
Int. Cl. C07c *69/66*
U.S. Cl. 260—484 R 4 Claims

Production of 2,2-dimethyl-1,3-propanediolmono(hydroxypivalate) by disproportionation of hydroxypivalaldehyde. The product is a valuable starting material for the production of synthetic resins and plasticizers.

3,641,118

PURIFICATION OF 2,2-DIMETHYL-1,3-PROPANE-DIOLMONO(HYDROXYPIVALATE)

Rolf Platz, Mannheim, and Franz Merger, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Oct. 4, 1968, Ser. No. 764,994
Claims priority, application Germany, Oct. 6, 1967, P 16 43 671.8
Int. Cl. C07c *69/66*
U.S. Cl. 260—484 R 9 Claims

Purification of 2,2-dimethyl-1,3-propanediol mono(hydroxypivalate) by means of acid ion exchangers.

3,641,119

PROCESS OF PREPARING CHLOROMETHYL ESTERS OF α,β-UNSATURATED CARBOXYLIC ACIDS

Gerhard Ballé, Cologne-Flittard, and Günter Kolb, Cologne-Stammheim, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 26, 1970, Ser. No. 5,890
Claims priority, application Germany, Feb. 28, 1969, P 19 10 105.4
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 H 1 Claim

Chloromethyl esters of α,β-unsaturated carboxylic acids are produced by reacting α,β-unsaturated carboxylic acid chloride with formaldehyde or with a formaldehyde donor in the presence of a catalytic quantity of ferric chloride or stannic chloride.

3,641,120

PROCESS FOR THE PRODUCTION OF LONG CHAIN ESTERS

Edward J. Broderick, Edison, and Burton M. Rein, East Brunswick, N.J., assignors to Mobil Oil Corporation

No Drawing. Filed Sept. 14, 1970, Ser. No. 72,228
Int. Cl. C07c *67/00*
U.S. Cl. 260—491 8 Claims

This specification discloses a process for the production of long chain esters. In this process, an ester of an acid having at least two carbon atoms and at least one hydrogen atom on the alpha carbon atom of the acid moiety is reacted with an olefin. This reaction is carried out in the presence, along with a manganic carboxylic acid salt or oxide, a zirconyl carboxylic acid salt or zirconium oxide.

3,641,121

PREPARATION OF VINYL ACETATE

Harold E. Swift, Gibsonia, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Jan. 12, 1968, Ser. No. 697,305
Int. Cl. C07c *67/04*
U.S. Cl. 260—497 A 8 Claims

A process for the preparation of vinyl acetate from acetic acid, ethylene and oxygen in the presence of a noble metal on an inert, high surface area support with at least about 80 percent of its pores having a diameter between about 10 and 35 angstroms.

3,641,122

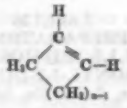
PROCESS FOR THE PREPARATION OF ALKENYL ESTERS

Gustave B. Bachman, West Lafayette, Ind., and Gerald M. Tullman, Creve Coeur, Mo., assignors to Purdue Research Foundation, Lafayette, Ind.

No Drawing. Filed Oct. 25, 1968, Ser. No. 770,838
Int. Cl. C07c *69/02*
U.S. Cl. 260—497 R 4 Claims

A process for preparing alkenyl esters by reacting an aliphatic carboxylic acid anhydride, such as propionic anhydride, and an olefin represented by the formula

wherein R is hydrogen or an alkyl radical, for example, 1-octene, or by the formula



wherein *n* is an integer ranging from 1 to about 10, for example, cyclohexene, in the presence of mercuric iodate.

3,641,123

SUBSTITUTED AMIDES OF 4-ARYL-3-HYDROXY BUTYRIC ACIDS

David Frank Hayman and Anthony Musgrave Wild, London, England, assignors B.D.H. Chemicals Limited

No Drawing. Filed Nov. 15, 1968, Ser. No. 776,264
Claims priority, application Great Britain, Nov. 15, 1967, 51,987/67
Int. Cl. C07c *103/30*; A61k *27/00*
U.S. Cl. 260—500.5 H 1 Claim

Substituted amides of 4-aryl-3-hydroxybutyric acids having utility as anti-inflammatory agents are provided. The amides are prepared by reacting a lower alkyl ester of a 4-aryl-3-hydroxybutyric acid with an excess of an appropriate amine. In the case of hydroxamic acids the product is isolated as a potassium or sodium salt which is converted into the free hydroxamic acid by acidification.

3,641,124

HEPTAMINOL TRANS-CINNAMATE

Bernard Pourrias, Meudon, Yves Huet, La Celle Saint-Cloud, and Carlos Pomaret, Paris, France, assignors to Delalande S.A., Courbevoie, Hauts-de-Seine, France

No Drawing. Filed Sept. 20, 1968, Ser. No. 761,324
Claims priority, application France, Sept. 25, 1967, 122,143
Int. Cl. C07c *91/04*
U.S. Cl. 260—501.17 1 Claim

Heptaminol cinnamate, useful as a myocardiotonic, coronary dilatator and uricosuric having diuretic activity

and a process for making same which comprises reacting cinnamic acid with heptaminol.

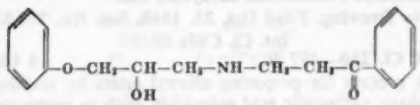
3,641,125

3-N-(2 - HYDROXY-3-PHENOXYPROPYL)-AMINO-1-PHENYLPROPANON-(1) AND THE SALTS THEREOF

Wolfgang Milkowski, Burgdorf, Werner Stuhmer, Eldagsen, and Klaus-Wolf von Eickstedt, Hannover-Bemerode, Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

No Drawing. Filed Dec. 4, 1969, Ser. No. 882,309
Claims priority, application Germany, Dec. 6, 1968, P 18 13 061.5
Int. Cl. C07c *93/06*
U.S. Cl. 260—501.18 **4 Claims**

3 - N - (2 - hydroxy-3-phenoxypropyl)-amino-1-phenylpropanone-(1) having the following formula



(I)

and the salts thereof, the said compounds being characterized by marked central inhibiting activity as well as having an effect on the circulatory and central nervous systems.

3,641,126

PROCESS FOR PREPARATION OF ETHANE-1-HYDROXY - 1,1,2-TRIPHOSPHONATES FROM ETHANECARBONYL-1,2-DIPHOSPHONATES

James B. Prentice, Batesville, Ind., assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,370
Int. Cl. C07f *9/38;* **C11d** *3/36*
U.S. Cl. 260—502.4 A **7 Claims**

Process for preparing ethane-1-hydroxy-1,1,2-triphosphonates which comprises reacting ethanecarbonyl-1,2-diphosphonic acid with at least one inorganic phosphorus-containing compound which is a phosphorous acid precursor alone or in admixture with phosphorous acid and hydrolyzing the reaction product obtained.

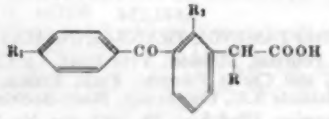
3,641,127

(3-BENZOYLPHENYL) ALKANOIC ACIDS

Daniel Farge, Val-de-Marne, Mayer Naoum Messer, Essonne, and Claude Moutonnier, Paris, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Jan. 25, 1968, Ser. No. 700,375
Claims priority, application France, Jan. 27, 1967, 92,828
Int. Cl. C07c *65/20, 149/40*
U.S. Cl. 260—516 **7 Claims**

(3-benzoylphenyl)alkanoic acids of the formula:



wherein R represents a hydrogen atom or an alkyl group containing 1 to 4 carbon atoms, R_1 represents a hydrogen atom or an alkylthio group containing 1 to 4 carbon atoms, and R_2 represents a hydrogen atom or a hydroxy or methoxy group, and salts thereof, for example 3-benzoylphenylacetic acid, have been found to possess pharmacodynamic properties and are especially useful as anti-inflammation agents.

3,641,128

ANTIFIBRINOLYTIC COMPOUNDS

Larry J. Loeffler, Bethesda, Md., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 17, 1969, Ser. No. 834,138
Int. Cl. C07c *101/04*
U.S. Cl. 260—514 B **4 Claims**

The compound 4 - (α - amino lower alkyl)bicyclo-[2.2.2]-octane-1-carboxylic acid and the pharmaceutically acceptable salts thereof are useful as antifibrinolytic compounds.

3,641,129

ANTIFIBRINOLYTIC COMPOUNDS

Larry J. Loeffler, Bethesda, Md., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 17, 1969, Ser. No. 834,139
Int. Cl. C07c *110/04*
U.S. Cl. 260—514 B **3 Claims**

The compound 4-aminomethylbicyclo-[2,2,2]-octane-1-acetic acid and the pharmaceutically acceptable salts thereof are useful as antifibrinolytic compounds.

3,641,130

PROCESS FOR THE PRODUCTION OF AROMATIC POLYCARBOXYLATES

Donald G. Kuper, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Mar. 10, 1969, Ser. No. 805,855
Int. Cl. C07c *51/00, 51/52*
U.S. Cl. 260—515 P **9 Claims**

Improved catalytic disproportionation of aromatic carboxylates to aromatic polycarboxylates containing at least one additional carboxyl group is achieved by utilizing at least one compound of the formula R—X—M wherein R is an alkyl, aryl, or alkyl-substituted aryl radical, X is oxygen or sulfur and M is hydrogen or an alkali metal as a catalyst adjuvant in combination with a conventional disproportionation catalyst system.

3,641,131

HYDROLYSIS OF OLEFIN-SULFUR TRIOXIDE REACTION PRODUCT MIXTURES

David M. Marquis, Orinda, and William A. Sweeney, San Rafael, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of application Ser. No. 528,074, Feb. 17, 1966, and a continuation of application Ser. No. 591,712, Nov. 3, 1966. This application Mar. 19, 1969, Ser. No. 809,485
Int. Cl. C07c *143/16*
U.S. Cl. 260—513 R **5 Claims**

Improved and novel n-α-olefin sulfonate detergents are obtained when a crude α-olefin-sulfur trioxide reaction product is hydrolyzed substantially completely at a temperature above about 145° C.

3,641,132

PROCESS FOR OBTAINING NITRO BENZOPHENONES

Johann G. D. Schulz and Richard Seekircher, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Jan. 23, 1969, Ser. No. 793,597
Int. Cl. C07c *79/36, 79/46*
U.S. Cl. 260—517 **8 Claims**

A process for preparing nitro benzophenones which involves adding nitric acid to a diarylalkane and maintain-

ing the resulting mixture at the reaction temperature for a time sufficient to convert the diarylalkane to the corresponding nitro benzophenone.

3,641,133
INTERMEDIATES IN THE PREPARATION OF 4-AMINODIBENZO[a,d]-CYCLOALKEN-5-ONES

Eugene E. Galantay, Morristown, and Hans Ott, Convent Station, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 444,023, Mar. 30, 1965, now Patent No. 3,424,796. This application Sept. 30, 1968, Ser. No. 763,940
Int. Cl. C07c *101/54*
U.S. Cl. 260—518 R **7 Claims**

A 4-chloro-7-amino-3-substituted phthalide, e.g., 3-β-phenethyl-4-chloro-7-methylaminophthalide, is saponified and the saponification product reduced to obtain the corresponding 6-phen(alkyl)-anthranilic acid, e.g., 6-β-phenethyl-N-methyl-anthranilic acid, which is then cyclized to the corresponding pharmaceutically useful 4-amino-10,11-dihydro-5H-dibenzo[a,d]cyclohepten-5-one or 4-amino-5,10,11,12-tetrahydrodibenzo[a,d]cycloocten-5-one.

3,641,134
OXY SUBSTITUTED BIPHENYLENE CARBOXYLIC ACIDS

Tsung-Ying Shen, Bruce E. Witzel, and Gordon L. Walford, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 836,659, June 25, 1969. This application Apr. 20, 1970, Ser. No. 30,293
Int. Cl. C07c *65/14*
U.S. Cl. 260—520 **7 Claims**

New substituted biphenylene carboxylic acids and non-toxic pharmaceutically aceptable salts, esters, anhydrides, and amides derived therefrom. The substituted biphenylene carboxylic acids described herein have anti-inflammatory, anti-pyretic, and analygesic activity. Also included is a method of preparing said carboxylic acids.

3,641,135
PROCESS FOR OXIDIZING A 1,1-BIS(ALKYLPHENYL) ALKANE

Anatoli Onopchenko, Monroeville, Johann G. D. Schulz, Pittsburgh, and Richard Seekircher, Cheswick, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed May 8, 1970, Ser. No. 35,891
Int. Cl. C07c *63/02, 65/20*
U.S. Cl. 260—524 R **20 Claims**

A process for oxidizing a 1,1-bis(alkylphenyl)alkane, wherein the alkane bridge has at least two carbon atoms, to convert alkyl substituents to carboxylic acid substituents which involves contacting the 1,1-bis-(alkylphenyl) alkane with oxygen in a lower carboxylic acid containing cobalt and an aliphatic hydrocarbon having from three to six carbon atoms.

3,641,136
PROCESS FOR OXIDIZING A 1,1-BIS(ALKYLPHENYL) ALKANE

Anatoli Onopchenko, Monroeville, Johann G. D. Schulz, Pittsburgh, and Richard Seekircher, Cheswick, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed May 8, 1970, Ser. No. 35,892
Int. Cl. C07c *63/02, 65/20*
U.S. Cl. 260—524 R **16 Claims**

A process of oxidizing a 1,1-bis(alkylphenyl)alkane to convert alkyl substituents to carboxylic acid substituents which involves contacting the 1,1-bis(alkylphenyl)alkane with oxygen in a lower carboxylic acid containing cobalt and a methylenic ketone.

3,641,137
PREPARATION OF METHACRYLIC ACID

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Feb. 19, 1969, Ser. No. 800,744
Int. Cl. C07c *53/28, 57/04*
U.S. Cl. 260—526 N **12 Claims**

Acetylenic hydrocarbons are hydrocarboxylated by contact with carbon monoxide and a carboxylic acid in the presence of a catalyst comprising a complex of a Group VIII noble metal and a biphyllic ligand under liquid phase reaction conditions at temperatures between 50° C. and 400° C. and at pressures sufficient to maintain liquid phase. The product anhydrides are readily hydrolyzed to unsaturated acids which are useful as polymerizable monomers.

3,641,138
METHOD FOR PRODUCING UNSATURATED ALDEHYDES AND ACIDS

John A. Ondrey, Springdale, and Harold E. Swift, Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed May 31, 1968, Ser. No. 733,312
Int. Cl. C07c *47/22, 57/04*
U.S. Cl. 260—530 N **11 Claims**

A method of oxidizing propylene and isobutene to the corresponding unsaturated aldehydes and acids and for oxidizing the unsaturated aldehydes of propylene and isobutene to the corresponding unsaturated acids by the vapor phase reaction with molecular oxygen in the presence of a catalyst of cobalt molybdate promoted with a composition of molybdenum, tellurium and oxygen. Propylene is converted to acrolein and acrylic acid and acrolein in converted to acrylic acid.

3,641,139
ETHYLENE OXIDATION IN THE PRESENCE OF IRIDIUM METAL

Noel W. Cant and William K. Hall, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,806
Int. Cl. C07c *53/08*
U.S. Cl. 260—533 R **8 Claims**

Ethylene is oxidized with oxygen to acetic acid which is substantially free of other oxygenated organic products by oxidation of the ethylene in the presence of iridium metal.

3,641,140
PROCESS FOR THE PREPARATION OF CHLOROALKANE SULPHONYL CHLORIDES

Wolfgang Keberle, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 14, 1968, Ser. No. 767,513
Claims priority, application Germany, Nov. 9, 1967, F 53,993
Int. Cl. C07c *143/70*
U.S. Cl. 260—543 R **2 Claims**

Chloroalkane sulphonyl chlorides are prepared by reacting a cyclicthioether also known as a sultone, with the chloride of an inorganic acid at a temperature from about 40 to about 150° C. in the presence of an acid amide.

3,641,141

PROCESS FOR THE PREPARATION OF ALKYL-THIONO-PHOSPHONIC ACID DICHLORIDES

Hanshelmut Schlör, Wuppertal-Elberfeld, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Nov. 1, 1968, Ser. No. 772,818
Claims priority, application Germany, Nov. 21, 1967, P 16 68 043.6
Int. Cl. C07f 9/42
U.S. Cl. 260—543 P 14 Claims

Reacting dialkyl disulfide as sulfur donor in the presence of alkali metal- or ammonium-chloride with the Clay-Kinnear-Perren complex $[alkyl\text{-}PCl_3]^+[AlCl_3X]^-$, in which X is chlorine or bromine, formed from alkyl-chloride or alkylbromide, phosphorus trichloride and aluminium trichloride to produce alkyl-thiono-phosphonic acid dichloride, in which the alkyl radical is based upon the corresponding starting alkyl-chloride, said produced dichloride being recoverable from the reaction mixture by distillation, e.g. at about 190–220° C.; such alkyl-thiono-phosphonic acid dichlorides being known intermediates for the preparation of insecticidal thionophosphonic acid esters.

3,641,142

PYROGENIC SYNTHESIS OF PERFLUORO-ACRYLYL FLUORIDE

David C. England, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 577,143, Sept. 6, 1966. This application Oct. 30, 1968, Ser. No. 771,995
Int. Cl. C07c 51/58
U.S. Cl. 260—544 F 4 Claims

Process for preparing perfluoroacrylyl fluoride by the pyrolysis, e.g., at 350°–800° C., of α-hydrotetrafluoropropionic acid anhydride or α-hydrotetrafluoropropionyl fluoride preferably with a two-component catalyst system, e.g., quartz and an alkali metal fluoride.

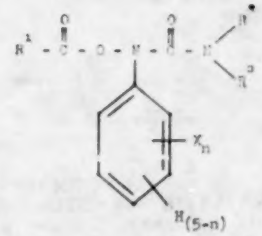
3,641,143

N-CARBAMOYL-O-ALKENOYL-N-PHENYL-HYDROXYL-AMINES AS HERBICIDES

Sidney B. Richter, Chicago, and John Krenzer, Oak Park, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Filed Aug. 15, 1968, Ser. No. 752,796
Int. Cl. C07c 127/22; A01n 9/20
U.S. Cl. 260—545 R 6 Claims

This invention discloses new chemical compounds of the formula



wherein R^1 is alkenyl; R^2 and R^3 are independently selected from the group consisting of hydrogen and alkyl; X is selected from the group consisting of alkyl, alkenyl, halogen, haloalkyl, alkoxy, nitro and dialkylamino; and *n* is an integer from 0 to 5. This invention further discloses new herbicidal compositions comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of the above description.

3,641,144

CYCLOALIPHATIC CARBOXYLIC ANHYDRIDE REACTION AND REACTION PRODUCTS

Robert C. Kuder, Excelsior, Minn., assignor to General Mills, Inc.

No Drawing. Continuation-in-part of application Ser. No. 570,736, Aug. 8, 1966. This application Mar. 13, 1969, Ser. No. 807,112
Int. Cl. C07c 61/12, 61/28
U.S. Cl. 260—546 1 Claim

A cycloaliphatic C_8–C_{18} olefin having ethylenic unsaturation at an exocyclic carbon position is reacted with an anhydride of a C_2–C_{18} carboxylic acid having an available alpha-hydrogen atom in the presence of a free radical initiator thereby forming a novel cycloaliphatic organic acid anhydride adduct. This new class of compounds can be used to make perfumes by conversion to the esters, or to corresponding acids, salts, nitriles or other derivatives.

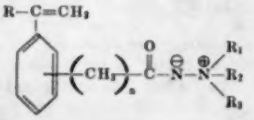
3,641,145

VINYL AROMATIC AMINIMIDES

Billy M. Culbertson, Savage, William J. McKillip, Minneapolis, and Edward A. Sedor, Bloomington, Minn., assignors to Ashland Oil, Inc.

No Drawing. Filed Aug. 23, 1967, Ser. No. 662,571
Int. Cl. C07c 103/30
U.S. Cl. 260—558 H 7 Claims

Vinyl aromatic aminimides are prepared from vinyl aromatic acids or derivatives thereof. The vinyl aromatic aminimide can be homopolymerized and copolymerized to result in functional group-containing polymeric products capable of thermosetting. The vinyl aromatic aminimides have the general formula



(I)

wherein R is a hydrogen, methyl, or halogen; *n* is zero or one and R_1, R_2, and R_3 are hydrocarbon radicals and R_1 and R_2 can be combined to form a heterocyclic ring with the nitrogen.

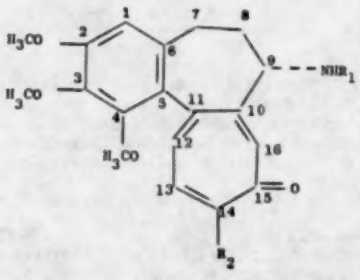
3,641,146

HALOCOLCHICINE DERIVATIVES

Hans Lettre, Heidelberg, Germany, and Thomas J. Fitzgerald, Minneapolis, Minn., assignors to E. Merck AG, Darmstadt, Germany

No Drawing. Filed Feb. 24, 1969, Ser. No. 802,329
Claims priority, application Germany, Feb. 23, 1968, P 16 95 547.8
Int. Cl. C07c 103/38
U.S. Cl. 260—562 CL 11 Claims

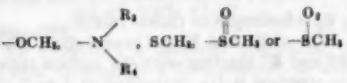
Novel antimitotically effective halocolchicine compounds of the formula



wherein

R_1 represents a mono-, di- or trihaloacyl residue of 2–4 carbon atoms;

R_2 represents



R_3 is CH_3 or C_2H_5; and

R_4 is H, CH_3 or C_2H_5.

3,641,147

2-POLYFLUOROLOWERALKYL BENZOPHENONES

John G. Topliss, West Caldwell, N.J., assignor to Schering Corporation, Bloomfield, N.J.

No Drawing. Continuation-in-part of application Ser. No. 703,245, Feb. 6, 1968, which is a continuation-in-part of application Ser. No. 650,581, July 3, 1967, now Patent No. 3,429,874, which is a continuation-in-part of application Ser. No. 603,737, Dec. 22, 1966, which in turn is a continuation-in-part of application Ser. No. 520,658, Jan. 14, 1966. This application Mar. 28, 1969, Ser. No. 811,637

Int. Cl. C07c *103/33*

U.S. Cl. 260—562 **5 Claims**

This invention relates to novel chemical composition of matter useful as intermediates in the preparation of 2-oxo - 1,3 - dihydro-2H-1,4-benzodiazepines, and the 4-N-oxides thereof, having a polyfluoroloweralkyl radical attached at the 1-position thereof and to the methods for making and using such novel chemical intermediates.

3,641,148

AMINOPOLYCYCLODECANES

Robert John Stedman, Paoli, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Original application Oct. 11, 1965, Ser. No. 494,881, now Patent No. 3,456,008, dated July 15, 1969. Divided and this application Mar. 5, 1969, Ser. No. 813,390

Int. Cl. C07c *87/40*

U.S. Cl. 260—563 P **2 Claims**

1-amino and aminomethylpentacyclo

$$[6.2.4.0^{2,7}.0^{4,10}.0^{5,9}]$$

decanes, 3-amino and aminomethyltetracyclo

$$[5.3.0.0^{2,6}.0^{4,9}]$$

decanes, and 1-amino and aminomethyltetracyclo-$[5.2.0.0^{2,6}.0^{4,9}]$-nonanes are prepared starting from tetrachlorocyclopentadienone cyclic ethylene ketal and 1,4-cyclohexadiene and proceeding with ring-closure, hydrolysis and Favorskii reactions. The products are antivirals.

3,641,149

POLY(AMINOMETHYL)CYCLOPENTANES

William H. Edgerton, Strafford-Wayne, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed Apr. 15, 1969, Ser. No. 816,393

Int. Cl. C07c *87/32*

U.S. Cl. 260—563 R **6 Claims**

Poly(aminomethyl)cyclopentanes and mixed poly(aminomethyl)poly(hydroxymethyl)cyclopentanes are prepared by reducing the corresponding polyamido and polyamidopolyester derivatives of ciscyclopentanetetracarboxylic acid. The compounds are useful as organic intermediates and in the polymer art.

3,641,150

CYCLIC PROCESS FOR THE PREPARATION OF AN OXIME FROM A HYDROXYLAMMONIUM SALT SOLUTION

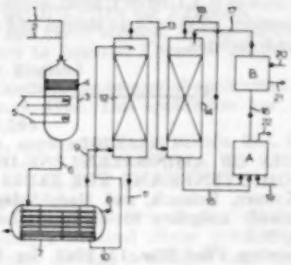
Abraham H. de Rooij, Geleen, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands

Filed Nov. 12, 1969, Ser. No. 875,725

Claims priority, application Netherlands, Nov. 12, 1968, 6816076

Int. Cl. C07c *131/00;* **C01b** *21/20;* **C01c** *1/00*

U.S. Cl. 260—566 A **2 Claims**



A cyclic process in which an aqueous acid reaction medium is kept in circulation between a zone for the synthesis of hydroxylamine and a zone for the synthesis of oxime. A gas flow containing NO and some NO_2 is continuously added to the circulating liquid, the greater part of the NO is being catalytically reduced with H_2 to form NH_2OH and some NH_3 as byproduct. The NH_2OH is consumed in the oxime synthesis zone and the NH_3 byproduct is continuously removed by contacting the circulating liquid with NO and NO_2 under such conditions that N_2 and H_2O result.

3,641,151

LIQUID CHLORINATED POLYARYL-POLYAMINE COMPOSITIONS

Michael Kokorudz, Grosse Ile, Mich., assignor to Wyandotte Chemicals Corporation, Wyandotte, Mich.

No Drawing. Filed May 21, 1969, Ser. No. 826,717

Int. Cl. C07c *87/28, 91/42*

U.S. Cl. 260—570 D **2 Claims**

Liquid chlorinated polyaryl-polyamine compositions are prepared by condensing, in the presence of water and sulfuric and/or hydrochloric acid, formaldehyde with o-chloroaniline in a mole ratio of o-chloroaniline to formaldehyde of from 2:1.05 to 2:1.5. The compositions are useful as curing agents for polyurethane prepolymers.

3,641,152

3,4-DIHYDRONAPHTHALENONEOXY-2-HYDROXY-PROPYLAMINES

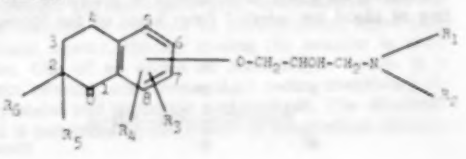
John Shavel, Jr., Mendham, and Sheldon Farber, Livingston, N.J., assignors to Warner-Lambert Pharmaceutical Company, Morris Plains, N.J.

No Drawing. Filed Sept. 23, 1968, Ser. No. 761,857

Int. Cl. C07c *93/06*

U.S. Cl. 260—570.7 **9 Claims**

The present invention relates to compounds of the formula:



wherein R_1 stands for hydrogen or an alkyl group and R_2 stands for an alkyl group of not more than 6 carbon atoms, preferably branched such as isopropyl, isobutyl, sec-butyl, tert-butyl, and the like; cycloalkyl groups of not more than 7 carbon atoms, such as cyclopropyl, cyclopropylmethyl, cyclopentyl, cyclopentylmethyl, cyclohexyl, cyclohexylmethyl; lower alkenyl or aralkyl groups, any of which may be optionally substituted; R_3 and R_4 each stand for hydrogen, or hydroxy; R_5 and R_6 each stand for hydrogen, alkyl, or aralkyl; OR_7, in which R_7 is lower alkyl or lower alkenyl, aralkyl such as benzyl in which aryl may be optionally substituted by halogen, nitro, etc.; halogens such as F, Cl, Br or I; nitro, amino or acylamino, or sulfonamido; alkyl such as methyl and containing not more than 6 carbons.

3,641,153

N-OXIDES OF AMINOALKYLENE-DIBENZO[a,d] CYCLOHEPTENES AND THE SALTS THEREOF

Emilio Kyburz, Reinach, and Hans Spiegelberg, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Mar. 12, 1969, Ser. No. 806,701
Claims priority, application Switzerland, Mar. 20, 1968, 4,201/68
Int. Cl. C07c *87/02*
U.S. Cl. 260—570.8 TC **14 Claims**

1 - halo-5-(3-dimethylaminopropyl or propylidene)-5H-dibenzo[a,d]cycloheptene N-oxides, prepared, inter alia, from the corresponding 1-halo-5-(3-dimethylaminopropyl or propylidene) - 5H - dibenzo[a,d]cycloheptenes, are described. The end products are useful antidepressants.

3,641,154

PROCESS OF SYNTHESIZING N-MONOALKYL PICRAMIC ACIDS

John Frank Corbett and Geoffrey Wilfred Amery, Reading, England, assignors to The Gillette Company, Boston, Mass.

No Drawing. Filed Jan. 23, 1969, Ser. No. 793,585
Claims priority, application Great Britain, July 10, 1968, 32,963/68
Int. Cl. C07c *91/44*
U.S. Cl. 260—571 **5 Claims**

A process for the preparation of N-monoalkyl-isopicramic acids in which the N-alkyl group contains up to 6 carbon atoms, which comprises nitrating an N-monoalkyl-p-aminophenol, in which the N-alkyl group contains up to 6 carbon atoms and in which the amino group remains free from acetylation with nitric acid in the presence of sulfuric acid at a temperature from −20° to +30° C. to introduce two nitro groups into said aminophenol.

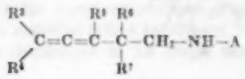
3,641,155

ALLENE POLYAMINES

Charles H. Tilford, Atlanta, Ga., and Thomas R. Blohm and Robert D. MacKenzie, Cincinnati, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y.

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,408
Int. Cl. C07c *87/24, 87/32, 87/50*
U.S. Cl. 260—583 H **20 Claims**

Compounds which have activity in inhibiting the clotting of blood are selected from bases of the formula



Formula I

wherein:

(A) R^3 is hydrogen, (lower)alkyl or (lower)alkenyl;

(B) R^4 is (lower)alkyl or (lower)alkenyl;

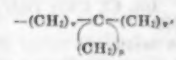
(C) R^3 and R^4 taken together with the carbon atom to which they are attached is cycloalkyl of 5 to 7 ring carbon atoms;

(D) R^5 is hydrogen or (lower)alkyl;

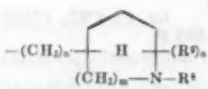
(E) each of R^6 and R^7 is (lower)alkyl, (lower)alkenyl, or R^6 and R^7 together with the carbon atom to which they are attached is (i) cycloalkyl of 5 to 7 ring carbon atoms; (ii) cycloalkenyl of 5 to 7 ring carbon atoms; or (iii) bicycloalkyl selected from bornyl, norbornyl or norbornenyl;

(F) A is the group (i)

wherein X is alkylene of 2 to about 8 carbon atoms and separates the adjacent nitrogen atoms by an alkylene chain of at least 2 carbon atoms, monohydroxy alkylene of 3 to about 8 carbon atoms, and separates the adjacent nitrogen atoms by an alkylene chain of at least 3 carbon atoms, or a cycloalkyl-substituted alkylene group of the formula



wherein each of (v) and (v') is an integer of 0 to 4, (μ) is an integer of 3 to 5 provided that at least one of (v) and (v') is 1, and the total of (v), (v') and (μ) is not greater than 8, R^1 is hydrogen, (lower)alkyl, phenyl, hydroxy(lower)alkyl, cycloalkyl of 4 to 6 ring carbon atoms, di(lower)alkylamino(lower)alkyl, pyridyl(lower) alkyl, piperidyl(lower)alkylamino(lower)alkyl, or piperidyl(loweralkyl, R^2 is hydrogen, (lower)alkyl or hydroxy (lower)alkyl, or R^1 and R^2 taken together with the nitrogen to which they are attached is piperazino, N-(lower) alkylpiperazino, morpholino, pyrrolidino, aziridino, piperidino, (lower)alkylpiperidino, (lower)alkylimidazolidino, or (ii) A is



wherein (n') is an integer of 0 to 3, (m) is an integer of 1 or 2, R^8 is hydrogen, (lower)alkyl, (lower)alkenyl, hydroxy(lower)alkyl, phenyl(lower)alkyl, cyano(lower)alkyl, piperidino(lower)alkyl, R^9 is (lower)alkyl; and (n) is an integer of 0 to 4; or pharmacologically acceptable acid addition salts of said bases.

3,641,156

JUVABIONE AND DERIVATIVES THEREOF

Beverly Ann Pawson, Montclair, and Gabriel Saucy, Essex Falls, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Continuation-in-part of application Ser. No. 725,208, Apr. 29, 1968. This application Mar. 3, 1969, Ser. No. 803,964
Int. Cl. C07c *49/61*
U.S. Cl. 260—586 **6 Claims**

This invention is directed to a method of synthesizing Juvaboine and novel derivatives thereof which are useful in killing and preventing proliferation of insects by upsetting their hormone balance including itermediates in this process.

3,641,157
HYDROCARBON OXIDATION

Herbert Riegel, Palisades, N.J., Harvey D. Schindler, New York, N.Y., and Morgan C. Sze, Upper Montclair, N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Oct. 23, 1968, Ser. No. 769,792
Int. Cl. C07c *45/02*
U.S. Cl. 260—599 17 Claims

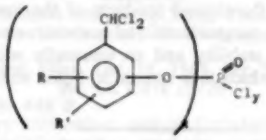
Process for producing a carbonyl compound or acid wherein a feed containing a hydrocarbon is contacted with an oxygen-containing gas a melt containing a multivalent metal halide in both its higher and lower valence state. The preferred melt contains a mixture of copper chlorides.

3,641,158
PROCESS FOR THE PRODUCTION OF AROMATIC HYDROXYALDEHYDES

Adolph J. Deinet, Woodcliff Lake, and David X. Klein, Upper Montclair, N.J., assignors to Tenneco Chemicals, Inc.

No Drawing. Filed Mar. 10, 1969, Ser. No. 805,820
Int. Cl. C07c *47/56*
U.S. Cl. 260—600 4 Claims

Salicylaldehyde and other hydroxybenzaldehydes are prepared by heating an ester having the structural formula



wherein R and R' are each hydrogen, chlorine, bromine, lower alkyl, or lower alkoxy; *x* and *y* are each 1 or 2; and the sum of *x* and *y* is 3 with water at a temperature at which the ester is hydrolyzed and the aldehyde is simultaneously steam-distilled from the reaction mixture.

3,641,159
PROCESS FOR THE PREPARATION OF ORGANIC HALIDES AND ORGANIC ETHERS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Mar. 5, 1969, Ser. No. 804,695
Int. Cl. C07c *41/10, 17/16*
U.S. Cl. 260—611 R 7 Claims

Organic halides and organic ethers are prepared by treating the corresponding alcohol with a mixture of two metal halide catalysts at conditions which include a temperature of from about 100° to about 250° C. and a pressure ranging from atmospheric to about 100 atmospheres.

3,641,160
ADDUCTS OF TETRABROMODIALKOXY CYCLOPENTADIENES AND ALLYL ALCOHOL

Richard Garth Pews, Midland, Clare R. Hand, Sanford, and Carleton W. Roberts, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application Apr. 12, 1968, Ser. No. 721,106, now Patent No. 3,489,814, dated Jan. 13, 1970. Divided and this application June 16, 1969, Ser. No. 833,692
Int. Cl. C07c *43/18*
U.S. Cl. 260—611 F 1 Claim

The invention concerns new compositions of matter that are the Diels-Alder adducts of tetrabromodialkoxy cyclopentadienes having the general formula $C_5Br_4(OR)_2$ wherein R is an alkyl radical having from 1 to 8 carbon atoms and allyl alcohol which compounds are useful for the control of pigweed, as flame-proofing agents and as fire retardants.

3,641,161
NAPHTHYL ALKANOLS

John H. Fried and Ian T. Harrison, Palo Alto, Calif., assignors to Syntex Corporation, Panama, Panama

No Drawing. Filed July 2, 1968, Ser. No. 741,904
Int. Cl. C07c *43/20*
U.S. Cl. 260—613 D 15 Claims

β-[2-naphthyl] ethanols optionally substituted at the β-position and/or position C–1, 4, 5, 7 or 8; and/or position C–6 possess anti-inflammatory, analgesic, anti-pyretic and anti-pruritic activity.

3,641,162
PRODUCTION OF ETHERS

Duncan Clark and Percy Hayden, Norton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

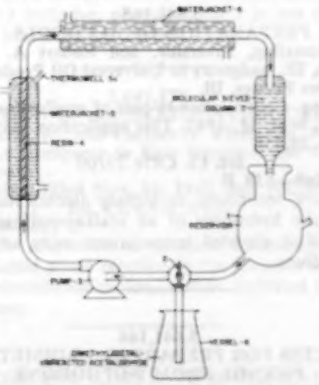
No Drawing. Continuation-in-part of application Ser. No. 402,937, Oct. 9, 1964. This application Apr. 3, 1969, Ser. No. 813,295
Claims priority, application Great Britain, Oct. 14, 1963, 40,420/63
Int. Cl. C07c *41/06, 41/10*
U.S. Cl. 260—614 AA 8 Claims

A process for the production of alkyl-alkenyl ethers comprising passing a terminal alkene containing two to four carbon atoms through a solution consisting essentially of a salt or co-ordination compound of palladium, a polar solvent, an alkanol having one to four carbon atoms, an alkali metal halide other than a fluoride and up to 10% by weight of water, at a temperature not exceeding 150° C. and at a partial pressure of the alkene of up to 100 atmospheres, and removing the alkyl-alkenyl ether formed in the gas stream of alkene.

3,641,163
PROCESS FOR PREPARING DIMETHYLACETAL

Owen Portwood, Jr., Charles M. Starks, and Paul H. Washecheck, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Aug. 14, 1969, Ser. No. 850,152
Int. Cl. C07c *43/30*
U.S. Cl. 260—615 A 4 Claims



Dimethylacetal is prepared by passing a mixture of acetaldehyde and methanol over an acidic catalyst. The water of reaction is removed by a dehydrating agent (e.g. molecular sieves), thereby driving the reaction to completion. Use of an excess of acetaldehyde results in a product mixture, after removal of water, comprising dimethylacetal and unreacted acetaldehyde. The dimethylacetal is recovered by distillation of the product mixture.

3,641,164
PROCESS FOR THE MANUFACTURE OF ORTHOFORMIC ACID ALKYLESTERS

Kurt Sennewald, Knapsack, near Cologne, Alexander Obrodnik, Liblar, and Hubert Neumaier, Knapsack, near Cologne, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

Filed Dec. 2, 1969, Ser. No. 881,536
Claims priority, application Germany, Dec. 3, 1968, P 18 12 371.2
Int. Cl. C07c *43/32*
U.S. Cl. 260—615 A **2 Claims**

Production of orthoformic acid alkylesters by reacting hydrocyanic acid with a monohydric alcohol and hydrogen chloride at low temperatures to obtain the corresponding formimidoalkylester (formiminoalkylether)-hydrochloride in an anhydrous, inert organic sylvent and by reacting the formimidoalkylester-hydrochloride with a further quantity of the alkyl alcohol to obtain the orthoformic acid alkylester. The formation of the formimidoalkylester-hydrochloride is effected in two steps. The first step comprises conveying a substantially equimolar mixture of hydrocyanic acid and an alkyl alcohol having from 1 to 4 carbon atoms through a cooler having a large inner surface and a high heat transmission coefficient, and introducing gaseous hydrogen chloride in a molar ratio of HCl:HCN between 1:1 and 1.1:1 into the mixture travelling through the cooler and cooled down to a temperature between −8° C. and −18° C. The second step comprises pouring the mixture coming from the cooler into cooled, organic solvent, the solvent being used at a rate of between about 1000 bis 1500 cubic centimeters per 1000 grams of theoretically expected formimidoalkylester-hydrochloride and at a temperature of between −20° C. and +8° C. Following crystallization of the formimidoalkylester-hydrochloride, further alkyl alcohol is added, without neutralization of hydrogen chloride in excess, to the said formimidoalkylester-hydrochloride in a quantity corresponding to 80 to 90% of the alcohol quantity theoretically needed, the mixture is maintained at temperatures between 0 and 50° C., crystallized ammonium chloride is isolated, and the orthoformic acid alkylester is purified by subjecting it to distillative treatment.

3,641,165
PREPARATION OF ALCOHOLS

Louis Schmerling, Riverside, and Robert A. Dombro, Chicago, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 668,693, Sept. 18 1967. This application May 4, 1970, Ser. No. 34,538
Int. Cl. C07c *29/00*
U.S. Cl. 260—618 R **9 Claims**

A primary, secondary, or tertiary alcohol may be prepared by the hydrolysis of an aralkanesulfonic acid or salt thereof at elevated temperatures using an alcoholic alkali medium.

3,641,166
PROCESS FOR PREPARING 3,5-DIMETHYLPHENOL FROM ISOPHORONE

Karl Rühl, Duisburg-Meiderich, Heinz-Gerhard Franck, Sudring, and Johannes Turowski, Castrop-Rauxel, Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

No Drawing. Filed June 26, 1969, Ser. No. 836,984
Claims priority, application Germany, July 10, 1968, P 17 68 875.4
Int. Cl. C07c *37/06*
U.S. Cl. 260—621 R **3 Claims**

According to the invention 3,5-dimethylphenol is prepared by catalytic conversion of isophorone in the gaseous phase at temperatures in the range of 450–600° C., in the presence of a catalyst consisting of a chromium-nickel-steel alloy of the 18/8 type which contains about 74% of iron, 18% of chromium and 8% of nickel. The 3,5-dimethylphenol is obtained e.g. in a yield of 65–68% by weight. No deposits of carbon are formed on the catalyst and the activity of the catalyst remains constant for a practically unlimited period of time.

3,641,167
HIGHLY FLUORINATED ALKYLADAMANTANES

Robert E. Moore, Wilmington, Del., and Edward J. Janoski, Havertown, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

No Drawing. Continuation-in-part of abandoned application Ser. No. 314,529, Oct. 7, 1963. This application Mar. 17, 1965, Ser. No. 440,614
Int. Cl. C07c *23/38*
U.S. Cl. 260—648 F **12 Claims**

This invention relates to highly fluorinated alkyladamantanes having 12–14 carbon atoms per molecule. More specifically the alkyladamantanes from which the fluorinated products are derived are 1,3-dimethyladamantane, 1,3,5-trimethyladamantane, 1-ethyladamantane, 1-ethyl-3-methyladamantane and 1-ethyl-3,5-dimethyladamantane. The fluorinated products of the invention are liquids at room temperature and are characterized by a high degree of stability and an unusually wide temperature range in which they remain in liquid state.

3,641,168
1,3,5-HALOXYLENE EXTRACTION

John D. Bacha, Monroeville, and Charles M. Selwitz, Pitcairn, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 785,798, Dec. 20, 1968. This application Dec. 3, 1969, Ser. No. 881,851
Int. Cl. C07c *25/04*
U.S. Cl. 260—650 R **4 Claims**

Selective extraction of 1,3,5-chloroxylene from other chloroxylene isomers initially present in a heterogeneous mixture comprising an HF layer relatively rich in 1,3,5-chloroxylene and a contacting organic layer relatively poor in 1,3,5-chloroxylene is effected by heating the heterogeneous mixture to a sufficiently high temperature to ensure that the HF layer is uppermost in the extraction vessel.

In a preferred embodiment, the extraction is conducted in the absence of a diluent.

3,641,169
STABILIZATION OF CHLORINATED SOLVENTS

Clarence R. Crabb, Elk Grove, Ill., and Leighton S. McDonald, Angleton, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 608,748, Jan. 12, 1967. This application Oct. 30, 1968, Ser. No. 771,976
Int. Cl. C07c *17/42*
U.S. Cl. 260—652.5 R **13 Claims**

Organic mercaptans and disulfides inhibit the metal-catalyzed reaction of an epoxide wth a carboxylic acid. Consequently, these sulfur compounds are useful as secondary inhibitors in epoxide-stabilized chlorinated solvents which may become contaminated with organic acids and metals, for example, degreasing and metal cleaning solvents.

3,641,170
ETHYLENE TELOMERIZATION
Kay L. Nakamaye, Moraga, Lynn H. Slaugh, Lafayette, William W. Spooncer, Walnut Creek, and Hendrik C. Volger, Richmond, Calif., assignors to Shell Oil Company, New York, N.Y.
No Drawing. Filed June 11, 1969, Ser. No. 832,465
Int. Cl. C07c *17/28, 67/00*
U.S. Cl. 260—658 C 7 Claims
Ethylene and organic iodides are telomerized to higher-molecular-weight organic iodide products in the presence of iron, nickel, copper, zinc or cadmium metal as catalyst.

3,641,171
ETHYLENE TELOMERIZATION
William W. Spooncer, Richmond, Calif., assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed June 11, 1969, Ser. No. 832,431
Int. Cl. C07c *17/00*
U.S. Cl. 260—658 C 5 Claims
Ethylene and organic iodides are telomerized to higher-molecular-weight organic iodide products in the presence of a copper chelate of a β-diketone monoenolate.

3,641,172
PROCESS FOR PREPARING 1,2-DICHLOROETHANE
Morris A. Johnson and Kang Yang, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.
No Drawing. Filed Apr. 21, 1969, Ser. No. 818,147
Int. Cl. C07c *17/20*
U.S. Cl. 260—658 R 6 Claims
Quaternary ammonium salts and quaternary phosphonium salts are disclosed as catalyzing agents for improving the reaction between 1,2-dibromoethane and an alkali metal chloride or ammonium chloride for producing 1,2-dichloroethane and an alkali metal bromide or ammonium bromide.

3,641,173
PRODUCTION OF POLYCYCLIC HYDROCARBONS
Richard Gregory Foster, Macclesfield, David Richard Joy, Stockton-on-Tees, and Paul Hepworth and Edward Charles Dart, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Aug. 10, 1970, Ser. No. 62,613
Claims priority, application Great Britain, Aug. 12, 1969, 40,312/69
Int. Cl. C07c *13/28*
U.S. Cl. 260—666 PY 14 Claims
Polycyclic hydrocarbons are produced by a three stage process in which a cyclopentadiene is condensed with an acyclic substituted olefine, the substituents removed from the intermediate to form a double bond and the product in turn reacted with an acyclic conjugated di-olefine. For example, vinyl chloride may be reacted with cyclopentadiene to form nortricyclyl chloride, the latter dehydrohalogenated with a sodium alcoholate, and the norbornadiene produced condensed with isoprene to form 1,4-endomethylene-6-methyl - 1,4,5,8,9,10 - hexahydronaphthalene. By varying the cyclopentadiene to vinyl chloride ratio in the first stage polycyclic ring structures containing an increasing number of rings may be obtained.

3,641,174
DIOLEFIN DISPROPORTIONATION REACTIONS
James E. Lyons, Wallingford, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Mar. 7, 1969, Ser. No. 805,343
Int. Cl. C07c *1/00*
U.S. Cl. 260—666 A 6 Claims
Cyclic, semicyclic or acyclic diolefins can be disproportionated to simultaneously form one hydrogenated and one dehydrogenated product through the use of a ligand-stabilized Group VIII transition metal complex in homogeneous solution. These catalyst complexes, which are hydrocarbon-soluble, uniquely provide a homogeneous rather than a heterogeneous catalyst system for this type of reaction.

3,641,175
PROCESS FOR THE PRODUCTION OF DIMERS AND TRIMERS OF CONJUGATED DIENES
Gunther Wilke and Ernst Willi Muller, both of Kaiser-Wilhelm-Platz 1, Mulheim (Ruhr), Germany
No Drawing. Division of application Ser. No. 532,900, Mar. 9, 1966, which is a continuation-in-part of application Ser. No. 76,520, Dec. 19, 1960, and a continuation of application Ser. No. 555,203, June 3, 1966, which in turn is a continuation of application Ser. No. 203,753, June 20, 1962. This application Oct. 17, 1969, Ser. No. 867,394
Claims priority, application Germany, Dec. 22, 1959, St 15,930; Apr. 28, 1960, St 16,427; June 30, 1961, St 18,017
Int. Cl. C07c *3/10*
U.S. Cl. 260—666 B 39 Claims
Production of dimers and trimers of 1,3-diolefins with a carbonyl moiety-free complex of a transition metal of Group VIII of the Periodic Table and an electron donor.

3,641,176
OLEFIN OLIGOMERISATION PROCESS
Derek Keith Jenkins, Southampton, and Christopher George Piers Dixon, Leeds, England, assignors to The International Synthetic Rubber Company Limited, Southampton, England
No Drawing. Filed Sept. 19, 1968, Ser. No. 761,000
Claims priority, application Great Britain, Sept. 20, 1967, 42,862/67; Mar. 7, 1968, 11,270/68
Int. Cl. C07c *3/10, 15/02*
U.S. Cl. 260—668 B 6 Claims
A catalyst system and process for the polymerisation of ethylene and cyclic hydrocarbons having at least one vinyl group to form oligomers and co-oligomers (polymers of two or three monomer units), the catalyst comprises a zerovalent nickel complex of formula

$$Ni(PA_xB_{3-x})_4$$

where A is hydrogen, substituted or unsubstituted alkyl, cycloalkyl, aryl, aralkyl alkoxy or aryloxy. B is halogen and x is 0–3 inclusive, provided that x is less than 3 in at least one branch of the complex.

3,641,177
ALKYLATION OF AROMATIC HYDROCARBONS
Paul E. Eberly, Jr., and Charles N. Kimberlin, Jr., Baton Rouge, La., assignors to Esso Research and Engineering Company
No Drawing. Filed Nov. 26, 1969, Ser. No. 880,367
Int. Cl. C07c *3/52*
U.S. Cl. 260—671 C 9 Claims
Process for alkylation of aromatic hydrocarbons with olefins by liquid phase reaction in the presence of a crystalline aluminosilicate zeolite catalyst activated in a particular manner.

3,641,178
PROCESS FOR ALKYLATING AROMATIC COMPOUNDS
Henricus Gerardus Josef Overmars, Zeist, Aris van Elven, Utrecht, and Jan Gerrit Noltes, Bunnik, Netherlands, assignors to International Lead Zinc Research Organization, Inc., New York, N.Y.
No Drawing. Filed Nov. 13, 1969, Ser. No. 876,584
Claims priority, application Netherlands, Dec. 6, 1968, 6817580
Int. Cl. C07c *3/56*
U.S. Cl. 260—671 P 10 Claims
This disclosure is concerned with a process for alkylating aromatic compounds in the presence of an unsup-

ported catalyst having at least 2 mols of a titanium tetrahalide per mol of a diorganozinc compound.

3,641,179
TRIMERIC HYDROCARBON
Charles Ferdinand Huebner, Chatham, N.J., assignor to Ciba Corporation, Summit, N.J.
No Drawing. Filed Nov. 7, 1969, Ser. No. 874,959
Int. Cl. C07c *15/20, 15/28*
U.S. Cl. 260—668 F **3 Claims**

Trimesanthracenobenzenes, e.g. those of the formula

$R_{1,2}$=H or alkyl
are high melting and thermally stable compounds.

3,641,180
METHOD OF DEHYDROGENATING COMPOUNDS
Robert A. Stowe, Midland, and Irvin J. Martin, Ludington, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Dec. 29, 1969, Ser. No. 888,967
Int. Cl. C07c *5/18, 11/02, 11/12*
U.S. Cl. 260—669 **11 Claims**

Strontium nickel phosphate catalysts are useful for oxydehydrating monoolefin hydrocarbons of 4 to 8 C atoms to the corresponding dienes and alkyl aromatic hydrocarbons having at least 2 C atoms in at least one alkyl group on the ring and ring halogenated derivatives of such aromatic hydrocarbons to the corresponding vinyl benzene aromatic compound. The reaction can be effected in the presence of steam in vapor phase, with 5–150 volume percent of oxygen, based on the hydrocarbon at a reactor inlet temperature of 400–700° C. The reaction can be run cyclically or continuously.

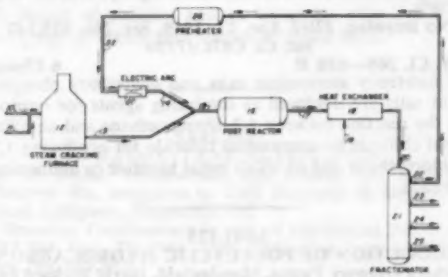
3,641,181
MICROEMULSION SEPARATION OF ORGANIC COMPOUNDS IN LIQUID STATE
Max L. Robbins, South Orange, and Darrell W. Brownawell, Scotch Plains, N.J., assignors to Esso Research and Engineering Company
No Drawing. Filed Sept. 10, 1969, Ser. No. 856,829
Int. Cl. C07c *7/10, 7/02;* **C10g**
U.S. Cl. 260—674 **7 Claims**

A process for separating a mixture containing liquid organic compounds, having different interfacial tensions when measured against substantially hydrocarbon-insoluble polar liquids, into its component parts comprises the steps of combining said mixture of organic liquids with surfactants and with a polar liquid substantially immiscible with any of the components of the mixture being separated thereby selectively forming two phases, one being a microemulsion rich in the organic components having the lower interfacial tension, wherein said polar liquid is the continuous phase, and the other being an oil phase rich in the components having the higher interfacial tension with respect to the polar liquid. The two phases are then separated.

3,641,182
HIGHLY CALCINED SUPPORT FOR CATALYTIC DEHYDROGENATION
E. O. Box, Jr., and David A. Uhrick, Bartlesville, Okla., assignors to Phillips Petroleum Company
No Drawing. Filed May 28, 1969, Ser. No. 828,777
Int. Cl. C07c *5/18*
U.S. Cl. 260—680 R **15 Claims**

Alkanes, cycloalkanes, arylalkanes, and particularly n-butane diluted with steam, are dehydrogenated in the absence of free O_2 at high conversion and selectivity to less saturated compounds with a novel highly calcined catalyst support such as alumina, silica, or a Group II aluminate spinel impregnated with a material selected from the group consisting of one or more Group VIII metals, a Group I*a* metal, and a tin group metal and mixtures thereof.

3,641,183
INJECTION OF AN ELECTRICALLY HEATED STREAM INTO A STEAM CRACKED PRODUCT
Robert P. Cahn, Millburn, and Derek J. Angier, Somerville, N.J., assignors to Esso Research and Engineering Company
Filed July 9, 1968, Ser. No. 743,484
Int. Cl. C07c *3/00, 11/24*
U.S. Cl. 260—683 **15 Claims**



A steam cracking feed mixture containing steam and hydrocarbon is conventionally cracked in the tubes of a steam cracking furnace. The conversion of hydrocarbon to cracked product can be increased by injecting a high temperature gaseous stream such as can be produced by electrical heating, into the mixture in the cracking furnace or into the mixture as it emerges from the cracking furnace, thus subjecting the furnace effluent to short residence time, high temperature cracking conditions. In one method, methane is electrically heated and cracked to a mixture comprising acetylene and hydrogen, which is then injected into the product from the steam cracker, thereby causing additional cracking of the steam cracker feed and quenching of the electrically cracked product to preserve the acetylene content thereof. The electrically heated stream may, however, contain hydrogen, steam, hydrocarbons, e.g. acetylene, or mixtures thereof as the components of greatest concentration.

3,641,184
OLEFIN ISOMERIZATION
Clifford E. Smith and Bobby J. White, Bartlesville, Okla., assignors to Phillips Petroleum Company
No Drawing. Filed Dec. 16, 1969, Ser. No. 885,629
Int. Cl. C07c *5/22*
U.S. Cl. 260—683.2 **12 Claims**

An olefin is isomerized by contact with a catalyst formed from a supported nickel complex associated with an aluminum compound.

3,641,185
ETHER PROMOTERS FOR LEWIS ACID CATALYZED ISOMERIZATION PROCESS

George M. Kramer, Berkeley Heights, N.J., assignor to Esso Research and Engineering Company

No Drawing. Filed June 16, 1969, Ser. No. 833,694
Int. Cl. C07c 5/30
U.S. Cl. 260—683.76 12 Claims

Addition of ethers as promoters for Lewis acid catalyzed isomerization, preferably taking place within a halo-aromatic solvent, results in the suppression of cracking and a corresponding maximization of the desired isomerization products. The ethers contain at least one secondary or tertiary alkyl radicals or cycloalkyl radicals.

3,641,186
PREPARATION OF BIS-ALKENYL MAGNESIUM COMPOUNDS

Lawrence H. Shepherd, Jr., Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 802,272, Feb. 25, 1969. This application Dec. 24, 1970, Ser. No. 101,422
Int. Cl. C07f 3/02
U.S. Cl. 260—665 R 7 Claims

Alpha-olefins undergo an addition reaction in the absence of a catalyst with bis(2-alkenyl)magnesium compounds. By conducting this reaction in an ether reaction medium having a basicity equal to or greater than that of diethyl ether the intermolecular addition does not proceed to any appreciable extent beyond the addition of one unit of the olefinic hydrocarbon per hydrocarbyl group in the initial organomagnesium reactant. Thus, the process proceeds quite cleanly to essentially pure higher molecular alkenyl magnesium compounds. The compounds have utility as components of catalyst systems and as intermediates for the preparation of various organic compounds.

3,641,187
PRODUCTION OF CYCLIC TRIMERS OF DIENES

Junji Furukawa, Kyoto-shi, Kyoto-fu, and Hiroyuki Morikawa, Ibaraki-ken, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo-to, Japan

No Drawing. Filed Sept. 9, 1969, Ser. No. 856,499
Claims priority, application Japan, Sept. 13, 1968, 43/65,945; Apr. 5, 1969, 44/26,503; June 4, 1969, 44/43,864
Int. Cl. C07c 3/10, 3/16
U.S. Cl. 260—666 B 18 Claims

Cyclododecatrienes (i.e., cyclic trimers of 1,3-dienes) are produced by causing at least one 1,3-diene to undergo cyclotrimerization by contacting a catalyst resulting from the combining of a titanium compound (e.g., titanium tetrachloride), an organo-aluminum compound (e.g., diethyl aluminum chloride), and an electron-donor component (e.g., a phosphite, phosphine, a pyridine derivative, or a thiophene derivative).

3,641,188
PROCESS FOR POLYMERIZING OLEFINS

Jin Sun Yoo, Riverdale, and Robert Koncos, Park Forest, Ill., assignors to Atlantic Richfield Company

No Drawing. Filed May 8, 1968, Ser. No. 727,735
Int. Cl. C07c 3/10
U.S. Cl. 260—683.15 D 19 Claims

A catalyst composition consisting essentially of:

(A) a lanthanide series metal compound, e.g., cerous acetylacetonate,

(B) a reducing agent, e.g., ethylaluminum sesquichloride,

(C) a non-protonic Lewis acid, e.g., ethylaluminum sesquichloride, and, as optional, preferred ingredients,

(D) a trihydrocarbylphosphine, e.g., triphenylphosphine, and

(E) an inert, organic solvent, e.g., chlorobenzene, is disclosed as being useful for catalyzing the polymerization of olefins or phenyl-substituted olefins to normally liquid polymers or oligomers, e.g., for catalyzing the dimerization of propylene.

3,641,189
DISPROPORTIONATION OF OLEFINES

Leonard Turner, Woking, Eric James Howman, Crowthorne, and Christopher Patrick Cadman Bradshaw, Sunbury-on-Thames, England, assignors to The British Petroleum Company Limited, London, England

No Drawing. Filed Aug. 26, 1965, Ser. No. 482,911
Claims priority, application Great Britain, Sept. 8, 1964, 36,722/64; Dec. 15, 1964, 50,985/64, Patent 1,054,864
Int. Cl. C07c 3/62, 11/02
U.S. Cl. 260—683 D 14 Claims

Acyclic mono olefins are disproportionated, i.e., converted into acyclic mono olefins of higher and lower carbon numbers than the feedstock olefin, in the presence of rhenium heptoxide on alumina.

3,641,190
DECOKING OF ONSTREAM THERMAL CRACKING TUBES

John A. Kivlen, Sparta, and Bert W. Struth, Plainfield, N.J., and Clifford P. Weiss, Henderson, Ky., assignors to Esso Research and Engineering Company

Continuation-in-part of application Ser. No. 554,239, Apr. 29, 1966, which is a continuation-in-part of application Ser. No. 407,569, Oct. 29, 1964. This application Jan. 22, 1969, Ser. No. 801,910
Int. Cl. C07c 3/30; C10g 9/16
U.S. Cl. 260—683 27 Claims

Thermal cracking of hydrocarbons in admixture with steam in tubes arranged in a cracking furnace leads to the deposition of coke on the interior walls of the tubes, which coke must be periodically removed in order to maintain cracking efficiency; the coke can be removed, without the necessity of shutting down the furnace, by cutting out the coking hydrocarbon feed to at least one tube and passing through such tube or tubes a decoking feed of steam and a hydrocarbon which when cracked will produce hydrogen as a by-product, the decoking feed being substantially sulfur free, while maintaining the furnace onstream and continuing the thermal cracking process in the tubes that are not being decoked.

3,641,191
METHOD FOR REDUCTION OF POLYMER FORMATION IN A PROCESS FOR CONVERTING ETHYLENE TO ALPHA OLEFINS

Herbert B. Fernald and William Gall, Glenshaw, and Russell G. Hay, Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Feb. 27, 1970, Ser. No. 15,197
Int. Cl. C07c 3/10
U.S. Cl. 260—683.15 D 6 Claims

Solid polymer formation in the trialkylaluminum conversion of ethylene to higher alpha olefins is inhibited by the addition of various unsaturated hydrocarbon inhibitors. The presence of butadiene, for example, inhibits solid polymer formation without any substantial adverse effect on the efficiency of the process.

3,641,192

PROCESS FOR THE PRODUCTION OF OXYMETHYLENE COPOLYMERS

France B. McAndrew, Summit, N.J., George W. Polly, Corpus Christi, Tex., and Walter E. Heinz, Greenville, S.C., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 624,630, Mar. 27, 1967, which is a continuation-in-part of application Ser. No. 190,001, Apr. 25, 1962, both now abandoned. This application Sept. 13, 1968, Ser. No. 759,790

Int. Cl. C08g *1/16, 23/00*

U.S. Cl. 260—823 **4 Claims**

Moldable oxymethylene copolymers are produced by a novel method in which trioxane is reacted with a preformed oxymethylene copolymer, containing a larger portion of comonomer than is desired in the final product. Trioxane polymerization catalysts are employed and the product is of a higher molecular weight and contains lower comonomer content than the preformed copolymer.

3,641,193

BURN-RESISTANT PLASTIC COMPOSITIONS

Victor S. Frank, Silver Spring, Edwin W. Lard, Bowie, and Eldon E. Stahly, Ellicott City, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed Apr. 17, 1969, Ser. No. 817,144

Int. Cl. C08g *45/06*

U.S. Cl. 260—830 **10 Claims**

Solid burn-resistant polymeric compositions are formed by reacting substances such as $Cl(PNCl_2)_9PCl_4$ and $(PNCl_2)_{3-4}$ with epoxy resins to form $PNCl_2$-epoxy prepolymers. These prepolymers are blended with organic liquid prepolymers such as phenolics, epoxies, polyurethanes and polyesters and the blends are cured to form fire resistant plastics, wherein initial P, N, and Cl contents are wholly retained. Those two components, i.e., $PNCl_2$ component and epoxy resin are admixed with liquid organic prepolymers (and polymerization catalysts therefor) and the system is then cured, usually by heating, whereby the $PNCl_2$-epoxy polymer is formed in situ along with the matrix polymer, or in some cases chemically bonded to the organic polymeric cross-linked plastic.

3,641,194

THERMOCURABLE POLYESTER-DIEPOXIDE COMPOSITIONS

Rolf Schmid, Reinach, Basel-Land, Ingrid Bucher, Basel, Willy Fisch, Binningen, and Hans Batzer, Arlesheim, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Feb. 4, 1969, Ser. No. 796,583

Claims priority, application Switzerland, Feb. 19, 1968, 2,361/68

Int. Cl. C08g *30/12, 45/14*

U.S. Cl. 260—835 **6 Claims**

Crystalline polymers are prepared by the formation of adducts from diepoxides, preferably diglycidyl ethers of diphenols, such as bisphenol A and acid polyesters of succinic acid and 1,4-butanediol (the recurrent structural unit of the formula $—O—(CH_2)_4—OCO(CH_2)_2—CO—$ must occur at least six times in the chain). The ratio of epoxide groups of the diepoxide to carboxyl groups of the polyester is 1:07 to 1.2, preferably about 1:1. Advantageously, a portion of the dicarboxylic anhydrides (for example a dodecenylsuccinic anhydride) is concomitantly used as chain cross-linking agent. Of advantage is for example an equivalent ratio of 1.3 epoxide group: 1.0 carboxyl group +0.2 anhydride group. After stretching, the polymers have a tensile strength of 700–1000 kg./cm.^{2} and an elongation at break of 50–150%. Above the crystallization transition temperature, they are rubber-elastic. They are used, for example, as potting and sealing compounds or for the manufacture of fibers, ribbons, foils.

3,641,195

CURABLE COMPOSITIONS CONTAINING AN EPOXIDE RESIN AND A COPOLYMER OF AN OLEFINE HYDROCARBON WITH AN OLEFINE ESTER

Alan Ball, Duxford, Barry James Hayes, Little Eversden, and Albert John Matthews, Duxford, England, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed July 11, 1969, Ser. No. 841,141

Claims priority, application Great Britain, July 18, 1968, 34,397/68

Int. Cl. C08g *45/04*

U.S. Cl. 260—837 R **16 Claims**

This application concerns curable compositions comprising:

(a) an epoxide resin,

(b) dispersed in particulate from in (a), a thermoplastic copolymer of an α-olefine hydrocarbon with an α-olefine which is an ether or is an ester of a carboxylic acid, and

(c) a curing agent for epoxide resins.

The copolymer (b) is preferably an ethylene-vinyl acetate copolymer, and the preferred curing agent is dicyandiamide. The compositions may also contain a latent accelerator, and a second thermoplast, suitably a phenoxy resin or a polysulphone.

Film adhesives prepared from these compositions form bonds with excellent peel strengths.

In an example, film adhesives were employed prepared from bisphenol A polyglycidyl ethers having an epoxide content of 5.7 and 0.25–0.42 equiv./kg., dicyandiamide, imidazole (accelerator), an ethylene-vinyl acetate copolymer, and a phenoxy resin.

3,641,196

STABILIZING POLYACETALS

Bruno Sander, Ludwigshafen (Rhine), Franz Schmidt, Mannheim, and Heinrich Sperber, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,116

Claims priority, application Germany, Apr. 25, 1968, P 17 69 243.2

Int. Cl. C08g *37/32*

U.S. Cl. 260—849 **13 Claims**

A process for heat stabilizing polyacetals by adding polycondensates of dicarboxylic diamides, polycarboxylic polyamides containing basic nitrogen, alkylenureas and formaldehyde.

3,641,197

POLYMER COMPOSITIONS AND METHOD FOR THE PRODUCTION THEREOF

William Dean Holland, Woodbridge, Joseph Michael Schmitt, Ridgefield, and Richard McDonald Griffith, Wilton, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Apr. 17, 1969, Ser. No. 817,154

Int. Cl. C08g *37/32*

U.S. Cl. 260—854 **10 Claims**

A method for the production of compositions comprising a polymer of methyl methacrylate, a copolymer of ethylene, and a polyalkylated polymethylolmelamine and the products produced thereby, are disclosed.

3,641,198

POLYAMIDES CONTAINING ANTISTATIC POLYOLEFINS HAVING PENDANT POLYOXYALKYLENE CHAINS

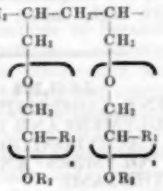
Pierre Grosjean, Le Brevent, France, assignor to Societe Rhodiaceta, Paris, France

No Drawing. Filed Aug. 17, 1970, Ser. No. 64,600

Int. Cl. C08g 41/04

U.S. Cl. 260—857 5 Claims

An antistatic composition and a shaped article produced therefrom in the form of yarns, fabric, knitted fabric, etc., comprising a base thermoplastic synthetic polymer selected from polyamides and polyesters containing dispersed therein a polyolefin having an average molecular weight of greater than 1000 in an amount of about 1 to about 10 percent by weight, said polyolefin comprising a polymer with the recurring structural unit of the formula:



wherein R_1 is selected from hydrogen and methyl; R_2 is selected from hydrogen, alkyl or aryl; and x is an integer of 1 to 600.

3,641,199

URETHANE ELASTOMER WITH ACTIVE HYDROGEN CONTAINING MONOETHYLENICALLY UNSATURATED MONOMER

Warren Dexter Niederhauser, Meadowbrook, Pa., Hector Belmares-Sarabia, Moorestown, N.J., and William Bauer, Jr., Philadelphia, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Filed July 7, 1969, Ser. No. 839,655

Int. Cl. C08g 41/04, 22/00

U.S. Cl. 260—859 R 28 Claims

A urethane elastomeric impact modifier is provided for rigid thermoplastic polymers. Polyester and polyether urethane elastomers are grafted to the acrylic polymers. Preferred is a polyester, diisocyanate and glycol urethane elastomer terminated with a functional monomer capable of ethylenic polymerization grafting with the acrylic polymer. The modified polymers offer an improved balance of physical properties including higher impact strength, clarity, and weather resistance.

3,641,200

BLOCK COPOLYCARBONATES CONTAINING POLYLACTONE BLOCKS AND DIHYDRIC PHENOL POLYCARBONATE BLOCKS

Markus Matzner, Edison, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Jan. 17, 1969, Ser. No. 792,125

Int. Cl. C08f 45/32; C08g 17/13, 39/10

U.S. Cl. 260—860 13 Claims

This invention relates to improved block copolycarbonates containing an amorphous, soft, rubbery segment or block composed of lactone units and another crystalline, hard, thermoplastic segment or block composed of dihydric phenol carbonate units.

3,641,201

ACID RESISTANT POLYESTER RESINS

William J. Heilman, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Nov. 10, 1969, Ser. No. 875,572

Int. Cl. C08f 21/00, 21/02

U.S. Cl. 260—867 3 Claims

The acid resistance and flexural strength of cross-linked polyester resins is increased by using small amounts of glycidyl methacrylate or glycidyl acrylate in their preparation.

3,641,202

UNSATURATED POLYESTER COMPOSITIONS CONTAINING VINYL POLYPHOSPHONATE COMPOUNDS

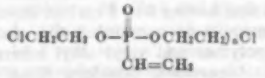
Jerome B. Biranowski, New York, and Edward D. Weil, Yonkers, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed May 28, 1969, Ser. No. 828,781

Int. Cl. C08f 21/00, 21/02

U.S. Cl. 260—869 12 Claims

Flame retardant resinous compositions and polymerizable compositions comprising an ethylenically unsaturated polymerizable polyester and cross-linking compounds containing $CH_2{=}C<$ groups. A portion of the $CH_2{=}C<$ groups are derived from vinyl polyphosphonate compounds of the formula:



wherein n is a number of at least 2.

3,641,203

POLYESTER MIXTURES SUITABLE AS FOUNDATION MATERIALS

Erich Eimers, Krefeld, and Wolfgang Deninger and Bernhard Alt, Krefeld-Bockum, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed June 3, 1969, Ser. No. 830,107

Claims priority, application Germany, June 29, 1968, P 17 69 701.7

Int. Cl. C08f 21/02

U.S. Cl. 260—870 5 Claims

The invention relates to polyester mixtures suitable as foundation materials which contain the following components:

(a) a polyester which contains the radicals of an α,β-ethylene-dicarboxylic acid, of a completely or partly hydrogenated o-phthalic acid and of 1,2-propylene glycol;

(b) a N,N - bis - (hydroxyalkyl) - arylamine incorporated with a saturated or unsaturated polyester; and

(c) a copolymerisable vinyl compound.

3,641,204

ADHESIVE COMPOSITION POLY(VINYL ALKYL ETHER) AND A CYCLIC ESTER POLYMER

Robert Dean Lundberg, Somerville, N.J., Joseph Victor Koleske and Dale Flavian Pollart, Charleston, W. Va., and Walter Henry Smarook, Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,320

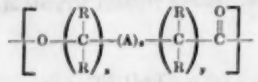
Int. Cl. C08g 43/02

U.S. Cl. 260—874 5 Claims

Composite articles having at least one solid substrate of such diverse nature as glass, leather, cellulosic solids

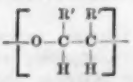
(including wood, paper, cotton and cellulose derivatives), polyamide solids, polyurethane solids, natural rubber solids, synthetic rubber solids, phenolic resin solids, epoxy resin solids, styrene polymer and copolymer solids and the like, bonded to an adhesive body which is anti-blocking (non-tacky) at ambient temperature but is heat activatable at relatively moderate temperature as low as 60° C. to provide excellent bonding upon cooling to ambient temperatures, and which comprises a cyclic ester polymer having recurring units of the formula:

(I)



wherein each R, individually, is selected from the class consisting of hydrogen, alkyl, halo, and alkoxy; A is the oxy group; x is an integer from 1 to 4; y is an integer from 1 to 4; z is an integer of zero or one; which the provisos that (a) the sum of $x+y+z$ is at least 4 and not greater than 7, and (b) the total number of R variables which are substituents other than hydrogen does not exceed 3, with or without recurring units of the formula:

(II)



wherein each R' is selected from the class consisting of, individually, hydrogen, alkyl, cycloalkyl, aryl, and chloroalkyl, and, together with the ethylene moiety of the oxyethylene chain of unit II, a saturated cycloaliphatic hydrocarbon ring having 4 to 8 carbon atoms. Also, novel adhesive compositions containing the above-described cyclic ester polymer and vinyl alkyl ethers in the form of solutions, dispersions, powders, films, coatings and granules or pellets. The invention is applicable to adhering a broad range of diverse types of substrates without the necessity of using high temperatures or long setting times or toxic materials. It is also applicable to the production of heat activatable coatings or seals for diverse packaging materials, laminating uses, construction uses, investment molding type castings, and repair uses.

3,641,205

RUBBERY POLYMERIC BLENDS

Ronald Turner La Flair and John Frederick Henderson, Sarnia, Ontario, Canada, assignors to Polymer Corporation Limited, Sarnia, Ontario, Canada

Filed Mar. 25, 1968, Ser. No. 715,630
Claims priority, application Canada, Apr. 1, 1967, 986,798, 986,799
Int. Cl. C08f *33/08, 41/12*
U.S. Cl. 260—876 B **6 Claims**

The physical properties of thermoplastic rubbery block copolymers, especially at elevated temperatures, are improved by adding minor amounts of a partially compatible synthetic resin having a softening point higher than that of the thermoplastic blocks of the block copolymer, e.g. polyacenaphthylene or polyalphamethylstyrene.

3,641,206

THERMOPLAST MOULDING COMPOSITIONS

Hans Weitzel, Leverkusen, Karl Dinges, Cologne-Stammheim, Wilhelm Göbel, Cologne-Flittard, and Dietrich Hardt, Bonn, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation of application Ser. No. 541,067, Apr. 8, 1966. This application Mar. 5, 1969, Ser. No. 806,028
Claims priority, application Germany, Apr. 21, 1965, F 45,864
Int. Cl. C08f *29/24, 33/08, 41/12*
U.S. Cl. 260—876 R **4 Claims**

Mixture comprising 30 to 95% by weight of a brittle and hard polymer such as a homopolymer or copolymer of styrene and 70 to 5% by weight of an elasticizing graft polymer of vinyl chloride on ethylene/vinyl acetate, said mixture being useful as a thermoplastic-elastic moulding composition distinguished by high notched impact and impact strengths and excellent resistance to aging and non-inflammability.

3,641,207

THERMOPLASTIC RESIN BLEND OF POLYSULFONE RESIN AND AN ETHYLENE-PROPYLENE TERPOLYMER OR GRAFT DERIVATIVE THEREOF

Robert L. Lauchlan, Granger, Ind., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed July 15, 1969, Ser. No. 842,009
Int. Cl. C08f *29/12, 41/12*
U.S. Cl. 260—876 R **10 Claims**

Blends of thermoplastic polysulfone resin and ethylene-propylene terpolymers and graft derivatives thereof are characterized by an unusually useful combination of properties, particularly low temperature melt processability in combination with high impact strength and flexural strength.

3,641,208

TRANSPARENT COMPOSITIONS OF VINYL HALIDE POLYMERS AND TERTIARY ALKYL STYRENE - ACRYLONITRILE - BUTADIENE RUBBER POLYMERS AND METHOD OF MAKING THE SAME

Richard H. Hall and Carleton W. Roberts, Midland, Andrew J. Sikkema, Farwell, and Junior J. Lamson, Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of abandoned application Ser. No. 611,822, Jan. 26, 1967. This application Nov. 17, 1969, Ser. No. 877,518
Int. Cl. C08f *41/12, 19/08*
U.S. Cl. 260—876 R **17 Claims**

Transparent compositions of matter comprising fusion blends of vinyl chloride polymers and resinous copolymers of a tertiary alkyl styrene, acrylonitrile and a butadiene polymer, e.g., polybutadiene.

3,641,209

EMULSION POLYMERIZATION EMPLOYING AZOACYL CATALYSTS

Karl-Heinz Ott, Leverkusen, Herbert Schuster, Cologne-Stammheim, Walter Meckel, Dusseldorf, Karl Dinges, Odenthal, and Erwin Müller, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 7, 1969, Ser. No. 805,348
Claims priority, application Germany, Mar. 26, 1968, P 17 70 059.3
Int. Cl. C08f *15/04, 19/18, 1/13*
U.S. Cl. 260—880 **3 Claims**

Process for producing graft copolymers from styrene, substituted styrenes and methyl methacrylate and from acrylonitrile, methacrylonitrile, methacrylates or mixtures thereof by polymerisation in the presence of an azoacyl compound as a catalyst.

3,641,210

RADIATION-CURABLE VINYL PAINT CONTAINING PENDANT UNSATURATION WITH INTERVENING ETHER FUNCTIONALITY

John F. Fellers and James E. Hinsch, Livonia, and Ernest O. McLaughlin, Garden City, Mich., assignors to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Nov. 4, 1968, Ser. No. 773,345
Int. Cl. C08f *15/00, 19/00*
U.S. Cl. 260—885 **15 Claims**

A film-forming, radiation-polymerizable, paint binder solution of vinyl monomers and an olefinically unsaturated vinyl monomer-comprising polymeric binder is ap-

plied as a liquid coating to an external surface of an article of manufacture and cured thereon with ionizing radiation. The binder polymer is characterized by having olefinic unsaturation between the terminal carbons of the side chains, i.e. alpha-beta unsaturation, with said unsaturation being separated from the principal carbon-to-carbon chain by two ether linkages. The binder polymer is formed by reacting an allylic glycidyl ether with a polymer formed by reacting an allylic alcohol with at least two different vinyl monomers at least one of which is an ester of acrylic or methacrylic acid.

3,641,211
SULFUR-CURABLE OLEFIN POLYMER COMPOSITIONS

Carl P. Strange and Gordon Y. T. Liu, Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Oct. 17, 1968, Ser. No. 768,512
Int. Cl. C08f *29/12*
U.S. Cl. 260—889 **6 Claims**

Sulfur-curable compositions of normally solid olefin polymers, such as polyethylene, and organic polymers having terminal ethylenic unsaturation, such as 1,2-polybutadiene are prepared by a method comprising the steps of (1) intimately admixing the polymeric components of the composition, (2) cracking the polymeric components of the resulting mixture using heating and shearing means, such as a screw-type extruder, and (3) introducing a sulfur curing agent into the cracked mixture.

3,641,212
HIGH IMPACT STRENGTH STYRENE-MALEIC ANHYDRIDE COMPOSITIONS

Munisamappa Narayana and Henno Keskkula, Midland, and Jerry E. Mason, Hemlock, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Mar. 28, 1969, Ser. No. 811,671
Int. Cl. C08d *9/08*; C08f *29/56*
U.S. Cl. 260—893 **6 Claims**

High impact compositions having high heat deformation characteristics are prepared by intimately admixing certain styrene-maleic anhydride and like thermoplastic copolymers with nitrile rubber containing from about 18 to 42 weight percent of a nitrile monomer.

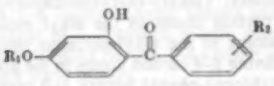
3,641,213
SYNERGISTIC UV ABSORBER COMBINATION FOR POLYPROPYLENE-POLYVINYLPYRIDINE BLEND

John Leo Rodgers, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Feb. 27, 1969, Ser. No. 803,087
Int. Cl. C08f *33/08, 45/60*
U.S. Cl. 260—895 **7 Claims**

An oxidation and light stable composition of matter comprising a polymer blend of a major proportion of a polypropylene and a minor proportion of polyvinylpyridine, and from about 0.1% to about 5%, based on the weight of the polymer blend, of a stabilizing combination of:

(a) a 2-hydroxybenzophenone ultraviolet absorber of the formula:



wherein R_1 is alkyl having 8 to 18 carbon atoms, and R_2 is a member selected from the group consisting of hydrogen, methyl, carbomethoxy, carbethoxy, and halogen; and

(b) an ultraviolet light absorber selected from the group consisting of (2 - hydroxyaryl)-s-triazines, 2-(2-hydroxyaryl)benzotriazoles and mixtures thereof;

the weight ratio of (a) and (b) being in the range of from about 5:1 to about 1:5.

3,641,214
METHOD OF STABILIZING POLYETHYLENE WITH ANION EXCHANGE RESINS

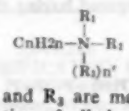
Cesare Reni, Milan, Italy, assignor to Societá Italiana Resine S.p.A., Milan, Italy

No Drawing. Continuation-in-part of application Ser. No. 563,377, July 7, 1966. This application Feb. 28, 1969, Ser. No. 803,435
Claims priority, application Italy, July 10, 1965, 15,564/65
Int. Cl. C08f *29/12*
U.S. Cl. 260—897 B **8 Claims**

An oxygen stable polyethylene comprising:

(a) polyethylene, and

(b) from 0.01 to 0.5% by weight, based on the polyethylene employed, of an anion exchanger selected from the group consisting of mono-vinyl aromatic/divinyl aromatic copolymers and liquid amine resins, said copolymers having substituted thereon, a group of the formula:



wherein R_1, R_2 and R_3 are members selected from the group consisting of alkyl and alkylol groups of from 1 to 4 carbon atoms, said n being an integer of from 1 to 4 and said n' being 0 to 1, and said liquid amine resins being N-dodecenyl (trialkyl methyl) amines of a molecular weight ranging from 351 to 393.

3,641,215
CO-CURABLE COMPOSITION USING PEROXIDES AND MALEIMIDES AS CROSSLINKING AGENTS

Teruyoshi Usamoto, Higashiosaka, and Taisuke Okita, Toyonaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,153
Int. Cl. C08f *29/12*
U.S. Cl. 260—897 A **18 Claims**

A co-curable composition is provided having excellent tensile strength, oil resistance, heat resistance, etc. comprising

(A) an ethylene-propylene copolymer or ethylene-propylene-unconjugated diene terpolymer;

(B) a propylene polymer and

(C) a crosslinking agent comprising an organic peroxide and a maleimide compound.

3,641,216
THERMOPLASTIC COMPOSITIONS FOR THE PREPARATION OF INHERENTLY FLEXIBLE, DIMENSIONALLY-STABLE, SOLVENT-WELDABLE SHEET MATERIALS

David F. Schnebelen, Plaquemine, and Robert B. Cramer, Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of abandoned application Ser. No. 659,555, July 24, 1967. This application Apr. 23, 1969, Ser. No. 818,810
Int. Cl. C08f *29/12*
U.S. Cl. 260—897 **3 Claims**

This invention relates to specified thermoplastic compositions based on intimate fusion blends of certain chlorinated olefin polymers with minor amounts of essentially linear, non-chlorinated olefin polymers. These compositions are particularly useful for the preparation of sheet material for use as flashing or membrane in various construction assemblies such material having unexpectedly

enhanced dimensional stability while retaining a necessary level of inherent flexibility and the ability to be easily solvent welded into unitary structures.

3,641,217

POLYMERIC PHENONE PHOTOSENSITIZERS AND BLENDS THEREOF WITH OTHER POLYMERS

Franco Agolini, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 23, 1969, Ser. No. 835,791
Int. Cl. C08f 29/12
U.S. Cl. 260—897 B 5 Claims

Improved polymeric photosensitizers based on acrylamido substituted phenones, useful for crosslinking polymers.

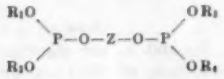
3,641,218

HYDROGENATED BIS PHENOL DIPHOSPHITES

Lester Friedman, Beachwood, Ohio, Kenneth H. Rattenbury, Morgantown, W. Va., and Alvin Guttag, Bethesda, Md., assignors to Weston Chemical Corporation, New York, N.Y.

No Drawing. Filed Aug. 29, 1968, Ser. No. 756,289
Int. Cl. C07f 9/08; C08f 45/581
U.S. Cl. 260—928 12 Claims

Compounds are prepared having the formula



where R_1, R_2, R_3 and R_4 are selected from the group consisting of alkyl, aryl, alkenyl, haloalkyl haloaryl or the monovalent residue of a hydrogenated dihydric phenol, Z is the divalent residue of a dihydric alcohol or a hydrogenated dihydric phenol, at least one of R_1, R_2, R_3 and R_4 is a residue of a hydrogenated dihydric phenol. Preferably at least 3 of R_1, R_2, R_3 and R_4 are such a hydrogenated dihydric phenol residue.

The compounds are useful as stabilizers for halogen containing polymers, hydrocarbon polymers, hydrocarbon oils, polyurethanes and polyesters.

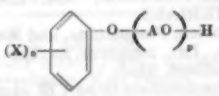
3,641,219

POLYHYDROXY PHOSPHATE ESTERS OF HALOGENATED PHENOL AND HALOGENATED ANILINE

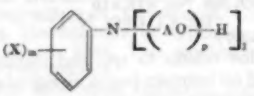
George J. Stockburger, Wilmington, Del., assignor to Atlas Chemical Industries Inc., Wilmington, Del.

No Drawing. Filed Dec. 9, 1968, Ser. No. 782,456
Int. Cl. C07f 9/08; C08g 22/44
U.S. Cl. 260—929 10 Claims

Polyhydroxy phosphate esters may be prepared by sequentially reacting polyphosphoric acid and alkylene oxide with an alcohol of the formula



or of the formula



wherein X represents a halogen atom, n is an integer from 1 to 5, m is an integer from 1 to 5, A represents an alkylene group containing from 2 to 4 carbon atoms, and p is from 1 to 5. The polyhydroxy phosphate esters are useful as intermediates in the production of flame-resistant products.

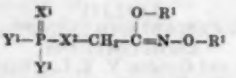
3,641,220

O(S)-(2-ALKOXYIMINO-2-ALKOXYETHYL) (MONO OR DITHIO) PHOSPHINATES

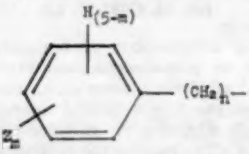
Sidney B. Richter, Chicago, and Ephraim H. Kaplan, Skokie, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Filed Sept. 18, 1968, Ser. No. 760,666
Int. Cl. C07f 9/32; A01n 9/36
U.S. Cl. 260—944 6 Claims

Compounds of the formula



wherein Y^1 and Y^2 are independently selected from the group consisting of alkyl, alkenyl and



wherein Z is selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, halogen, nitro, alkylsulfoxide, alkylsulfone and dialkylamino, m is an integer from 0 to 5, and n is an integer from 0 to 3; R^1 and R^2 are alkyl; and X^1 and X^2 are independently selected from the group consisting of oxygen and sulfur. This invention also discloses insecticidal and acaricidal compositions comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to insects and acarids, a compound of the above description; and further a method of destroying insects and acarids which comprises applying to said insects and acarids an aforedescribed insecticidal and acaricidal composition.

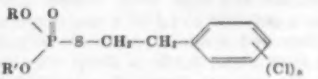
3,641,221

O-ALKYL-O-ARYL-THIOLPHOSPHORIC ACID ESTERS

Gerhard Schrader, Wuppertal-Cronenberg, Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal-Vohwinkel, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 9, 1969, Ser. No. 814,809
Claims priority, application Germany, May 9, 1968, P 17 68 399.7
Int. Cl. A01n 9/36; C07f 9/16, 9/18
U.S. Cl. 260—949 10 Claims

O-alkyl-O-aryl-thiolphosphoric acid esters, of the formula



(I)

in which

R is lower alkyl of 1–4 carbon atoms;

R′ is phenyl, chloro-substituted phenyl, alkylmercaptophenyl having 1–4 carbon atoms in the alkyl mercapto moiety, (alkyl)-(alkylmercapto)-phenyl having 1–4 carbon atoms in the alkyl moiety and 1–4 carbon atoms in the alkylmercapto moiety, alkoxyphenyl having 1–4 carbon atoms in the alkoxy moiety, (alkyl)-(chloro)-phenyl having 1–4 carbon atoms in the alkyl moiety, or naphthyl; and

n is a whole number from 0 to 2,

which posses arthropodicidal, especially acaricidal and insecticidal, properties and which may be produced by conventional methods.

3,641,222

S,S-DIALKYL-AMIDO-DITHIOPHOSPHATES

Marion F. Botts, Independence, Mo., and Erik K. Regel, Oberkohlfurth, Germany, assignors to Chemagro Corporation, Kansas City, Mo.

No Drawing. Filed Mar. 28, 1969, Ser. No. 811,631
Int. Cl. A01n 9/36; C07f 9/22, 9/24
U.S. Cl. 260—959 10 Claims

S,S-dialkyl-amido-dithiophosphates, i.e., S,S-dialkyl-(N-unsubstituted amido, N-mono and N,N-di alkyl, phenyl and/or chlorophenyl-substituted amido, as well as N-heterocyclic) - dithiol-phosphates, which possess defoliant and/or desiccant properties coupled with insecticidal and acaricidal properties.

3,641,223

S-(2-CHLORO-2-BROMO-ETHYL-(DI)THIO-PHOSPHORIC AND PHOSPHONIC ACID ESTERS

Hanshelmut Schlor, Wuppertal-Barmen, Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Aug. 28, 1968, Ser. No. 755,800
Claims priority, application Germany, Sept. 1, 1967, P 16 68 012.9
Int. Cl. C07f 9/08, 9/40; A01n 9/36
U.S. Cl. 260—961 5 Claims

(Alkyl and O-alkyl)-O-alkyl-S-(2-chloro-2-bromo-ethyl)-thiol- and -thionothiol-phosphoric and phosphonic acid esters which possess insecticidal, acaricidal and nematicidal properties.

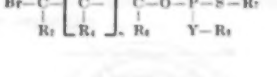
3,641,224

BROMOALKYL-(DI)-THIOLPHOSPHORIC ACID ESTERS

Hellmut Hoffmann, Wuppertal-Elbersfeld, and Hans Scheinpflug, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 13, 1969, Ser. No. 807,106
Claims priority, application Germany, Mar. 25, 1968, P 17 68 040.9
Int. Cl. A01n 9/36; C07f 9/16, 9/18
U.S. Cl. 260—964 15 Claims

Bromoalkyl-(di)-thiolphosphoric acid esters, i.e. O-[(2-bromo-optionally 1 and/or 2-alkyl and/or chloroalkyl)-ethyl and (3-bromo-optionally 1,2 and/or 3-alkyl and/or chloroalkyl)-propyl]-S-[akyl, chloroalkyl, phenyl, chlorophenyl and alkylphenyl]-[S-(alkyl, alkylmercaptoalkyl, phenyl, chlorophenyl and alkylphenyl) and O-(alkyl and cycloalkyl)]-thiol- and -dithiol-phosphoric acid esters of the formula



(I)

in which

R_1 to R_6, each individually, is hydrogen, alkyl of 1–2 carbon atoms, or chloroalkyl of 1–2 carbon atoms,

R_7 is alkyl of 1–4 carbon atoms, chloro atoms, chloro-substituted alkyl of 1–2 carbon atoms, phenyl, chlorophenyl, or alkylphenyl having 1–4 carbon atoms in the corresponding alkyl moiety,

Y is oxygen or sulfur,

R_8 is, when Y is sulfur, alkyl of 1–4 carbon atoms, alkylmercapto-alkyl having 1–4 carbon atoms in the alkylmercapto moiety and 1–4 carbon atoms in the alkyl moiety, phenyl, chlorophenyl, or alkylphenyl having 1–4 carbon atoms in the corresponding alkyl moiety whereas R_8 is, when Y is oxygen, alkyl of 1–4 carbon atoms or cycloalkyl of 5–6 ring carbon atoms, and

n is 0 or 1,

which possess fungicidal, bactericidal, and arthropodicidal, especially acaricidal and insecticidal, properties.

3,641,225

PROCESS FOR PREPARING CYCLIC PHOSPHOROHALIDITES

James L. Dever, Lewiston, and James J. Hodan, Williamsville, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Original application June 29, 1966, Ser. No. 561,329. Divided and this application Jan. 3, 1969, Ser. No. 801,902
Int. Cl. C07d 105/04; C08f 45/58
U.S. Cl. 260—976 10 Claims

A process is described for the preparation of a cyclic phosphorohalidite by reacting a glycol with a phosphorus trichloride or tribromide in the presence of a solvent such as dioxane and tetrahydrofuran. The resulting product is an intermediate in the preparation of fire retardant additives for plastics and resins.

3,641,226

METHOD FOR PURIFICATION OF DI-(2-ETHYL-HEXYL) PHOSPHORIC ACID

Jerry A. Partridge, Richland, Wash., and Reilly C. Jensen, San Diego, Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Nov. 24, 1969, Ser. No. 879,628
Int. Cl. C07f 1/08, 9/02
U.S. Cl. 260—990 8 Claims

Purification of di-(2-ethylhexyl) phosphoric acid (D2EHPA) in an organic solvent is accomplished by adding freshly precipitated copper hydroxide to the solution to form the copper salt of D2EHPA. The addition of acetone precipitates the copper salt which is separated from the solvent containing the impurities and washed. Treatment of the salt with a dilute mineral acid removes the metal ion, leaving the purified D2EHPA.

3,641,227

MANUFACTURE OF CERAMIC ARTEFACTS HAVING PORES

Geoffrey Winton Horsley, Wantage, and Ronald-Cyril Burnett, Dorchester, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 28, 1968, Ser. No. 716,729
Claims priority, application Great Britain, Apr. 20, 1967, 18,309/67
Int. Cl. G21c 21/00
U.S. Cl. 264—.5 13 Claims

In order to produce porous fuel of controlled voidage, green artefacts, e.g. spheres, are made of U_3O_8 or UC_2 and sintered until they are dense. They are then heated in a reducing atmosphere to remove oxygen or carbon, as the case may be, and give a porous final artefact of UO_2 or UC.

3,641,228

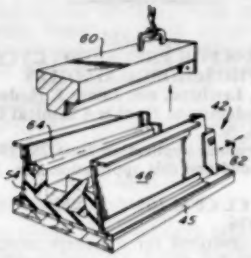
METHOD OF PRODUCING A MOLDED SIMULATED WOODEN ARTICLE

Paul H. Fleck, Melrose Park, Pa., assignor to Urethane Fabricators, Inc., Camden, N.J.

Filed Sept. 18, 1968, Ser. No. 760,414
Int. Cl. B29d 27/04
U.S. Cl. 264—53 1 Claim

A molded article formed of a synthetic polymeric material which identically simulates the appearance of a

wooden master in every detail including graining, knotholes, splits, and the like. This article is formed from polyurethane or a similar plastic material which can be cured under pressure in a mold, with or without the application of heat. The mold itself is formed as a reverse image of the master and is formed of silicone rubber or similar material which is adapted to be impressed with every textural feature of the master.



3,641,229

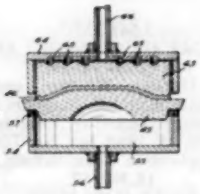
METHOD OF MAKING A PERMEABLE CERAMIC MOLD USED AS A SUBSTITUTE FOR PLASTER OF PARIS MOLDS

Willis G. Lawrence, Alfred, and Leon B. Coffin, Andover, N.Y., assignors to Research Corporation, New York, N.Y.

Continuation of application Ser. No. 735,161, Feb. 23, 1968, which is a continuation-in-part of application Ser. No. 511,407, Dec. 3, 1965, which in turn is a continuation of application Ser. No. 194,048, May 11, 1962, all now abandoned. This application July 1, 1970, Ser. No. 56,104

Int. Cl. C04b *21/06, 21/00, 21/04*

U.S. Cl. 264—43 **1 Claim**



A permeable ceramic structure having controlled pore size and useful as substitutes for plaster of paris molds is prepared by forming a uniform admixture of refractory material such as wollastonite or mullite, a fluxing material such as borax or glass frit, a hydrolyzed ethyl silicate, and optionally an alkalizing agent such as magnesia. After molding the hydrolyzed ethyl silicate is completely decomposed to ethyl alcohol and hydrated silica gel by action of heat or the alkalizing agent which causes the mixture to set or harden. The ethyl alcohol is then removed in a controlled rate at 35–40° F. and a high humidity atmosphere to avoid cracking. The dried shape is then fired at a temperature above the melting point of the fluxing material, but below the melting point of the refractory material to form a ceramic bond.

3,641,230

METHOD FOR MAKING PRESTRESSED LAMINATED FIBER GLASS STRUCTURES

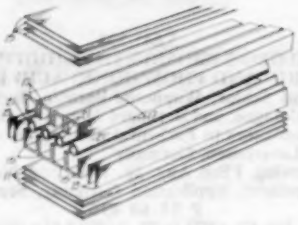
Herbert R. Jenks, Santa Ana, Calif., assignor to Dura Fiber, Inc., Costa Mesa, Calif.

Continuation-in-part of applications Ser. No. 643,926, June 6, 1967, Ser. No. 674,958, Oct. 12, 1967, and Ser. No. 696,458, June 8, 1968. This application Jan. 21, 1969, Ser. No. 792,587

The portion of the term of the patent subsequent to Feb. 3, 1987, has been disclaimed

Int. Cl. B29c *27/14*

U.S. Cl. 264—152 **20 Claims**



A method of molding fiber glass for structural applications to provide a unitary structure having outer skins separated by a plurality of ribs or trusses, whereby the skins and the ribs are prestressed. The outer dimensions can be made in virtually any shape dependent upon the shape of the mold in which the structure is fabricated, and the interior of the structure between the ribs is hollow. The method also makes possible the fabrication of tubular or semitubular members having a prestressed skin but no interior ribs. The method involves the use of a plurality of elastomeric bags or tubular members which are pressurized during a heating and molding cycle and which contribute to the prestressing of the fiber glass elements. In addition, the invention involves the method by which the various laminates are laid up and the manner in which the elastomeric bags interact with the laminates, so laid up, during the molding cycle.

3,641,231

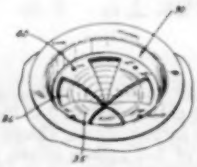
METHOD FOR MOLDING WASTE DISPOSER SPLASH SHIELD

Thomas R. Smith, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Original application Oct. 23, 1968, Ser. No. 769,920, now Patent No. 3,524,596, dated Aug. 18, 1970. Divided and this application Mar. 9, 1970, Ser. No. 17,697

Int. Cl. B29c *25/00;* **B29h** *3/06*

U.S. Cl. 264—155 **2 Claims**



A splash shield is molded so that a plurality of inwardly extending segmental members are connected by flash lines along corner portions of their top and bottom surfaces. The shield is then pierced either with a blunt instrument or manually to break the connecting flash lines.

3,641,232

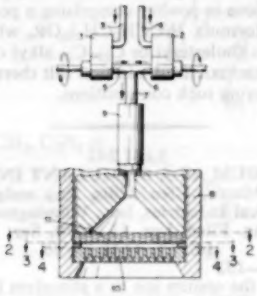
PROCESS FOR MAKING MULTIFILAMENT YARNS

Wilhelmus J. Fontijn and Korstiaan J. M. van Drunen, Dieren, Netherlands, assignors to American Enka Corporation, Enka, N.C.

Original application Aug. 28, 1967, Ser. No. 663,812, now Patent No. 3,447,308, dated June 3, 1969. Divided and this application Sept. 27, 1968, Ser. No. 794,438

Int. Cl. B29f 3/10

U.S. Cl. 264—171 3 Claims



A process for the manufacture of yarn consisting of a plurality of composite filaments which comprises passing two incompatible polymers side-by-side to a common mixing zone, forming a laminated stream and splitting up the laminated stream in a plane transverse to the direction of the flow of the laminated stream at least once into separate substreams to form a single stream containing one polymer as a matrix and the other as a multiplicity of continuous ultrafine cores within the zone, passing the single stream to spinneret orifices and extruding a plurality of composite filaments containing the ultrafine cores extending longitudinally through the matrix.

3,641,233

PROCESS FOR REGENERATING SPINNING BATHS

Cesare Reni and Luigi Lugo, Milan, Italy, assignors to Società Italiana Resine S.p.A., Milan, Italy

No Drawing. Filed Jan. 17, 1969, Ser. No. 792,155

Claims priority, application Italy, Jan. 27, 1968, 12,064/68; Oct. 15, 1968, 827,220

Int. Cl. B29h 19/00

U.S. Cl. 264—179 7 Claims

Baths used for coagulating threads spun from a dimethylformamide solution and for stretching the spun threads are regenerated by a process which includes the steps of mixing together the coagulating and spinning baths, extracting the mixture with dimethylformamide, recycling the residual paraffinic phase to the stretching and coagulating baths, treating the extract phase with water to separate it into an organic phase containing cumene which is recycled to the coagulating bath and an aqueous phase from which dimethylformamide is separated by distillation free from impurities.

3,641,234

MECHANICAL TREATMENT OF MATERIAL

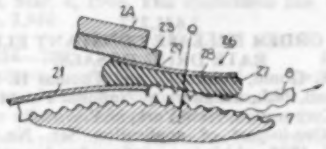
Alexander L. Trifunovic, James R. Hodges, and Richard L. Shick, Wilmington, Del., assignors to Joseph Bancroft & Sons Co., Rockford, Wilmington, Del.

Division of application Ser. No. 525,039, Feb. 4, 1966. Continuation-in-part of application Ser. No. 810,424, Jan. 13, 1969. This application Apr. 15, 1970, Ser. No. 28,217

Int. Cl. B29c 15/00; B29d 7/22

U.S. Cl. 264—282 13 Claims

The width of the advancing material is longitudinally compressed by being passed between a rotating roll and an overlying cover member. The cover member has a first plate which serves to define a first passage with the rotating roll and a second plate with a higher coefficient friction which serves to define a second passage with the rotating roll. A cavity is formed between the plates of the cover member and the rotating roll wherein the textile



material is subjected to an abrupt reduction in the driving force on the material while being simultaneously confined to a thickness slightly greater than the thickness in the first passage such that the material is longitudinally compressed within the cavity.

3,641,235

IMMUNOLOGICAL REAGENT AND PROCESS FOR MAKING SAME

Margaret Rozman Weiss, Florissant, Mo., assignor to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Nov. 1, 1968, Ser. No. 772,852

Int. Cl. G01n 31/22

U.S. Cl. 424—8 6 Claims

Immunologically specific reagents are prepared by chemically linking the immunological counterpart of the material to be detected to a cellulosic derivative in particulate form and then physically adsorbing onto the immunological counterpart an acidic indicator material. Hematoxylin, fluorescein, and titan yellow are usable as indicator materials. When a fluid sample containing the immunological material to be detected comes in contact with the immunologically specific reagent, the indicator material shows one of two visible effects, separation from the particles or fixation to the particles. The specific type of visible effect is determined by the particular immunologic counterpart employed. For each reaction a control fluid sample which does not contain the immunological material under test shows an opposite reaction. A chromatographic technique can be used to display the visible effects.

3,641,236

DOSAGE UNIT SUSTAINED RELEASE ORAL POWDERED LITHIUM SALT COMPOSITION FOR MANIC DEPRESSIVE OR DEPRESSIVE ILLNESS PROPHYLACTIC THERAPY

Alec James Coppen, Epsom, Surrey, England, and Jean-Pierre Metral, Paris, France, assignors to Delandale Laboratories Limited, Canterbury, Kent, England

No Drawing. Filed July 15, 1969, Ser. No. 841,964

Claims priority, application Great Britain, July 16, 1968, 33,845/68

Int. Cl. A61k 27/12

U.S. Cl. 424—19 7 Claims

This invention is concerned with pharmaceutical compositions and methods of making them. In particular, the composition contains principally a lithium salt as medicament and a sustained release agent comprising a mixture of glyceryl mono-, di- and triesters of one or more C_{16}–C_{18} straight chain saturated fatty acids. The composition is primarily intended for oral administration in the treatment of manic-depressive or depressive illness and provides a sustained and consistant release of the medicament into the blood stream during the period between successive doses. The method of the present invention consists in making tablets of the composition for oral

administration. With a mixture of the dry powdered medicament and a filler is mixed a solution of the sustained release agent. A binding agent is then added, and after drying and granulating a lubricant may be added before finally compressing into tablets.

3,641,237

ZERO ORDER RELEASE CONSTANT ELUTION RATE DRUG DOSAGE

Francis E. Gould, Princeton, and Thomas H. Shepherd, Hopewell, N.J., assignors to National Patent Development Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 766,840, Oct. 11, 1968, which is a continuation-in-part of application Ser. No. 654,044, July 5, 1967, which is a continuation-in-part of application Ser. No. 650,259, June 30, 1967, which in turn is a continuation-in-part of application Ser. No. 567,856, July 26, 1966, now Patent No. 3,520,949. This application is also a continuation-in-part of application Ser. No. 833,182, July 13, 1969. This application Sept. 30, 1970, Ser. No. 76,738

Int. Cl. A61k *27/12*

U.S. Cl. 424—16 **8 Claims**

Zero order release of water soluble pharmaceutically active organic compounds alone or absorbed or incapsulated in hydrophilic polymers is obtained by providing a film diffusion barrier of an alkoxyethyl acrylate or methacrylate polymer. To reduce irritation: an outer coating of a non-irritating water swellable film can be also incorporated.

3,641,238

STABLE DENTAL CREAM COMPOSITION

Joseph Paul Januszewski, Somerville, and Tayseer George Bahouth, Piscataway, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,084

Int. Cl. A61r *7/16*

U.S. Cl. 424—49 **6 Claims**

Dental cream containing polishing agent, benzyl alcohol, and oil of cloves flavor. Ethyl alcohol is present to stabilize the cream and to prevent separation of the cream.

3,641,239

COSMETIC WAX COMPOSITION

Sharon R. Mohrlok, Lansing, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 443,697, Mar. 29, 1965. This application Nov. 6, 1968, Ser. No. 773,939

Int. Cl. A61k *7/02*

U.S. Cl. 424—64 **18 Claims**

A cosmetic composition useful for lipsticks, lip rouge, mascara, styptic crayon and the like comprising cosmetic solvent, coloring agent and wax. The wax is at least 15 percent by weight silicone wax.

3,641,240

METHOD FOR THE TREATMENT OF AN EMBOLUS OR THROMBUS

Alan C. Hymes, Hopkins, Minn., and Rajko R. Margulis and Robert M. Nalbandian, Bloomfield Hills, Mich., assignors to Wyandotte Chemicals Corporation

No Drawing. Filed Sept. 27, 1968, Ser. No. 763,371

Int. Cl. A61k *27/00*

U.S. Cl. 424—78 **8 Claims**

Prevention of thrombosis in a blood vessel and reestablishment of the microcirculation through a thrombosed blood vessel are accomplished by introducing into the blood stream of a body an effective amount of solutions of polyoxyethylene polyoxypropylene block copolymers.

3,641,241

TYLOSIN - POLYOXYETHYLENE COMPOSITIONS FOR CONTROLLING MYCOPLASMA INFECTIONS

William W. Davis and Earl E. Ose, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 624,146, Mar. 20, 1967. This application Nov. 24, 1969, Ser. No. 879,577

Int. Cl. A61k *21/00*

U.S. Cl. 424—120 **12 Claims**

Compositions having enhanced activity against mycoplasma infections in poultry comprising a polyoxyethylene ether of the formula $H(OCH_2CH_2)_nOR$, wherein n is 10 to 35 and R is cholesteryl or C_{12}–C_{20} alkyl or alkenyl and tylosin or a nontoxic acid addition salt thereof and methods for employing such compositions.

3,641,242

USE OF CESIUM AS A STIMULANT IN MAMMALS

Howard L. Masco, Glen Mills, Pa., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,070

Int. Cl. A61k *27/00*

U.S. Cl. 424—153 **8 Claims**

The use of the cesium ion as a stimulant in mammals is disclosed where the cesium is administered as an organic or inorganic salt at a level sufficient to obtain a dose of from 0.1 to 5.0 milliequivalents of cesium per kilogram of body weight of the mammal and to establish a blood serum level of about 0.05 milliequivalent of cesium per liter.

3,641,243

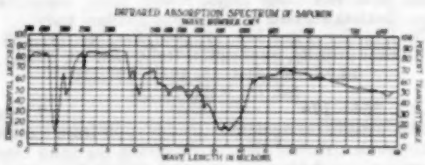
ACTIVE MATERIAL OF *ENTADA PHASEOLOIDES*

Wen Chih Liu, Paramus, N.J., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 824,216, May 13, 1969. This application Dec. 9, 1969, Ser. No. 883,575

Int. Cl. A61k *27/14*

U.S. Cl. 424—195 **2 Claims**



A saponin powder, obtainable by the evaporation of the methanol-water extract of the ground seeds of the plant, *Entada phaseoloides*, and the purified material as a crystalline solid with the empirical formula, $C_{45}H_{82}O_{27}$, melting at 223–225° C., inhibit Walker 256 tumor in rats.

3,641,244

METHODS AND COMPOSITIONS FOR TREATING BACTERIAL AND PROTOZOAN INFECTIONS

Alexander D. Argoudelis, Portage, and John H. Coats, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

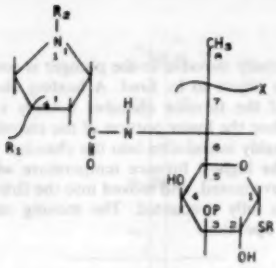
No Drawing. Continuation-in-part of application Ser. No. 768,879, Oct. 18, 1968, now Patent No. 3,544,582. This application May 22, 1970, Ser. No. 39,893

Int. Cl. A61k *21/00*

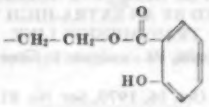
U.S. Cl. 424—181 **8 Claims**

This invention relates to a novel process for preparing antibacterial compounds and to novel compositions and methods for using them. It is particularly directed to a novel process for preparing 3-phosphate esters of lincomycin, of analogs thereof, and of celesticetins. The

compounds produced by the process of the invention can be shown by the following formula:



wherein R is CH_3, C_2H_5 or



R_1 is H, or cis or trans lower-alkyl of from 1 to 8 carbon atoms, inclusive; R_2 is H, CH_3, or C_2H_5; X is OH, chlorine, or bromine, each in the (R) or (S) configuration, or $—OCH_3$; and P is

and salts thereof.

Examples of alkyl of from 1 to 8 carbon atoms are methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, and octyl and isomers thereof.

3,641,245

SYNERGISTIC INSECTICIDAL MIXTURE CONTAINING BENZOTHIAZOLINES AND INSECTICIDAL USE OF THE MIXTURE

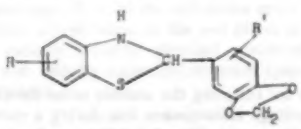
Peter F. Epstein, Prairie Village, Kans., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Dec. 27, 1968, Ser. No. 787,576

Int. Cl. A01n *9/12*

U.S. Cl. 424—188 **4 Claims**

Synergistic mixture of compounds of the formula



in which R and R′ are independently hydrogen, halogen, lower alkyl, lower alkenyl, or lower alkoxy with aryl N-methyl carbamates, pyrethrum, or allethrin, and the use thereof for controlling insects.

3,641,246

COMPOSITIONS FOR INHIBITING ANOMALOUS DEPOSITION AND MOBILIZATION OF CALCIUM PHOSPHATE IN ANIMAL TISSUE

Marion D. Francis, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Continuation-in-part of application Ser. No. 709,870, Mar. 4, 1968. This application Jan. 14, 1970, Ser. No. 2,960

Int. Cl. A61k *27/00*

U.S. Cl. 424—204 **12 Claims**

Compositions for inhibiting anomalous deposition and mobilization of calcium phosphates in animal tissue, comprising an effective amount of certain perfluorodiphosphonocycloalkenes and a pharmaceutical carrier; and a method for treating conditions involving pathological calcification and hard tissue demineralization in an animal comprising administering to such animal said compositions.

3,641,247

METHODS OF TREATING BACTERIAL INFECTIONS

Elton S. Cook, Cincinnati, Ohio, and Norbert J. Berberich, Jr., Burlington, Ky., assignors to Stanley Drug Products, Inc., Portland, Oreg.

No Drawing. Original application Mar. 4, 1968, Ser. No. 709,937. Divided and this application Dec. 14, 1970, Ser. No. 98,138

Int. Cl. A61k *27/00*

U.S. Cl. 424—211 **5 Claims**

A variety of substances are reported which alter host resistance to cocci bacterial infections. Nevertheless drugs which induce a high degree of resistance to these infections when administered prophylactically are not in wide use. Drugs which confer immunity to these infections for more than a week after administration are virtually unknown. Antimicrobials have been found which are effective in inducing resistance to infections due to cocci when administered prophylactically.

3,641,248

IMIDAZOLE SYNERGIST-ENHANCED PHOSPHORIC ESTER INSECTICIDE COMPOSITIONS AND INSECT CONTROL THEREWITH

Heinrich Adolphi, Limburgerhoff, Pfalz, Anna Steimmig, Ludwigshafen (Rhine), and Hermann Spaenig, Limburgerhof, Pfalz, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Original application July 11, 1966, Ser. No. 563,964, now Patent No. 3,531,494, dated Sept. 29, 1970. Divided and this application Oct. 14, 1969, Ser. No. 866,362

Claims priority, application Germany, July 22, 1965, P 15 42 690.1

Int. Cl. A01n *9/36;* **A61k** *27/00;* **A61l** *13/00*

U.S. Cl. 424—212 **8 Claims**

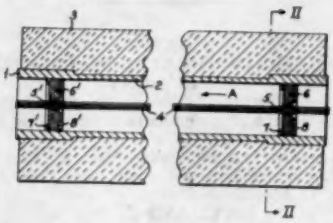
Insecticides containing (a) pyrethrins, carbamates or phosphoric esters and (b) an imidazole or imidazole salt in the weight ratio of 1:10 to 1:1 and processes of insect control therewith.

ELECTRICAL

ERRATUM

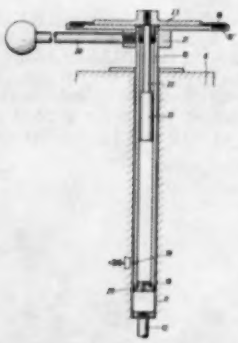
For Class 424—243 see:
Patent No. 3,641,013

3,641,249
TUBE FURNACE
Francis J. Higgins, Kenilworth, England, assignor to Courtaulds Limited, London, England
Filed Jan. 14, 1970, Ser. No. 2,692
Int. Cl. H05b *3/66*
U.S. Cl. 13—22 **7 Claims**



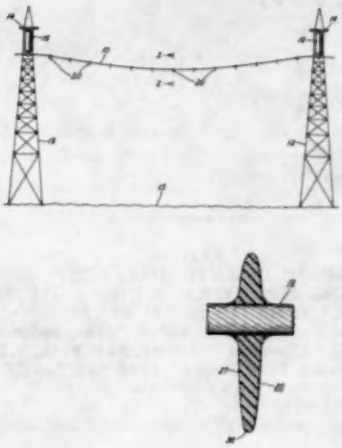
A tube furnace for the treatment of a continuously moving band of material which comprises a carbon or graphite furnace tube provided with radiation shields at each end of the hot zone thereof, which radiation shields comprise baffles of flexible carbon or graphite material, perforated to allow passage of the continuously moving band, and resiliently deformable in the direction of movement of that band. The furnace is particularly useful in the carbonization or graphitization of organic filamentary material.

3,641,250
VACUUM FURNACE
Karl Hintenberger, Hochstrasse 39, 6 Frankfurt am Main, Germany
Filed May 19, 1970, Ser. No. 38,721
Claims priority, application Germany, May 27, 1969, P 19 26 874.7
Int. Cl. H05b *1/00*
U.S. Cl. 13—31 **3 Claims**



The downwardly open chamber of an electrically heated vacuum furnace for dental ceramics and the like may be sealed by a plate mounted on a hollow plunger. The plunger is axially movably received in a stationary cylinder, and a driving plug axially movable in the plunger is connected to a carrier for the object to be fired. A heating element in the top portion of the furnace chamber bounds a firing zone much hotter than the lower portion of the chamber so that a green body freshly introduced into the chamber may be protected from the highest furnace temperature while the furnace is being evacuated, and moved into the firing zone after the furnace is fully evacuated. The moving mechanism is pneumatically operated.

3,641,251
SCHEME FOR REDUCING AUDIBLE NOISE DEVELOPED BY AN EXTRA-HIGH VOLTAGE TRANSMISSION LINE
Tseng W. Liao, Media, Pa., assignor to General Electric Company
Filed Oct. 16, 1970, Ser. No. 81,362
Int. Cl. H02g *7/00*
U.S. Cl. 174—40 R **4 Claims**



A scheme for reducing the audible noise developed by an extra-high voltage transmission line during a rainstorm. The scheme involves a plurality of disklike members of electrical insulating material mounted on the line conductor at spaced locations sufficiently close together that most of the rain water dropping off the conductor during a heavy rainstorm does so via drop-releasing regions on the disklike members which are spaced a substantial distance from the conductor.

3,641,252
DEVICE FOR CARRYING A FLAT ELECTRONIC APPARATUS BY AN AIRCRAFT
Germain Fournillon, Paris, France, assignor to Electronique Marcel Dassault, Paris, France
Filed Apr. 10, 1970, Ser. No. 27,360
Claims priority, application France, Apr. 28, 1969, 6913425
Int. Cl. H05k *5/02*
U.S. Cl. 174—52 R **4 Claims**

A device for carrying a flat electronic apparatus by an aircraft comprises a cylindrical housing of lightweight material having a metallized external surface and containing in its

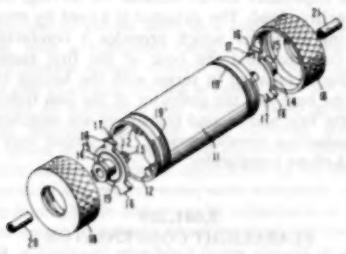
inner space slide-type holding and guide means for printed electronic circuit cards or the like. Two or more housings

connected by coupling collars can be disposed in axial alignment.

3,641,253
CABLE SPLICE COVER

William D. Weagant, Fremont, Calif., assignor to Sigman Industries Inc., Menlo Park, Calif.

Filed July 3, 1969, Ser. No. 838,854
Int. Cl. H02g *15/08*
U.S. Cl. 174—93 **7 Claims**



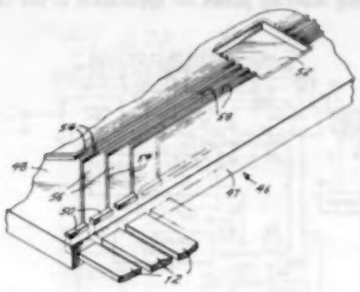
An in-line reenterable cable splice box with two end plates that can be sealed to the cable and a hollow cylinder that can be rigidly and removably supported and sealed between end plates by end caps. To hold the end plates apart a plurality of rigid members extend between the end plates or the cylinder can have radially inwardly directed spaced-apart lugs to cooperate with radially outwardly directed, spaced-apart lugs on the end plates.

3,641,254
MICROCIRCUIT PACKAGE AND METHOD OF MAKING SAME

Henry E. Bunting, Folcroft, and Paul E. Smith, Bala Cynwyd, both of Pa., assignors to W. S. Electronic Services Corporation, Clifton Heights, Pa.

Continuation-in-part of application Ser. No. 836,489, June 25, 1969, Continuation-in-part of application Ser. No. 656,749, July 28, 1967. This application June 27, 1969, Ser. No. 837,244
Int. Cl. H05k *1/18, 5/02*
U.S. Cl. 174—68.5 **27 Claims**

A microcircuit package formed of a dielectric substrate having a central area for mounting a circuit network device therein, such as a chip or wafer, metallic leads embedded in the substrate, grooves formed in one surface of the substrate providing between them raised portions or lands interconnecting the free ends of the leads with the recess and a conductive material on the lands thereby forming a raised conductive path from the leads to the recess. The invention also

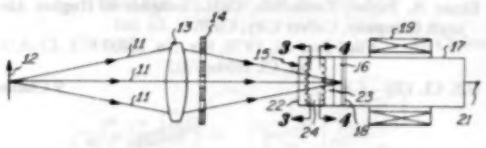


includes a method of making the microcircuit package accurately and economically.

3,641,255
NONINTERACTING LENS SYSTEM FOR A COLOR ENCODING CAMERA

Albert Macovski, Palo Alto, Calif., assignor to RCA Corporation

Filed Apr. 17, 1970, Ser. No. 29,448
Int. Cl. H04n *9/06*; **G02b** *27/12*
U.S. Cl. 178—5.4 ST **11 Claims**



In a color camera utilizing a color encoding strip filter arrangement in the optical path to separate light from an object into its component colors, an imaging system includes a noninteracting cylindrical lens array to image the encoding filter strips onto a photosensitive medium without the use of a relay lens.

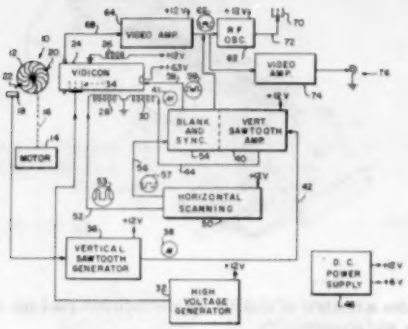
3,641,256
BLACK AND WHITE TELEVISION CAMERA EXPANDABLE TO A COLOR TELEVISION CAMERA

Gary F. Davis, Jr., R.R. #3, Columbus, Ind.

Filed Sept. 17, 1970, Ser. No. 72,968
Int. Cl. H04r *9/06, 9/34*
U.S. Cl. 178—5.4 ST **22 Claims**

In a television camera comprising a vidicon tube having a cathode and grid, a vertical yoke, and a horizontal yoke, the improvement comprising a color wheel assembly including a color wheel having a plurality of peripherally spaced-apart transparent color filter segments, the wheel being positioned and arranged relative to the vidicon tube to change the spectral response of its image pickup into an ordered sequence of colors, means for driving the wheel at a predetermined constant speed, and switch means responsive to movement of the wheel to provide a predetermined number of pulses per revolution of the wheel. First circuit means is provided for processing the pulses as well as color synch pulses. The camera includes blank and synch circuitry, and the improvement also comprises a multivibrator including alternately saturated collector circuits, one of the collector circuits being connected to the horizontal yoke to provide horizontal pulses thereto, the other of the collector circuits being con-

nected to the blank and synch circuitry to provide blanking pulses thereto. The blank and synch circuitry includes two NPN transistor stages, the first stage of which produces positive-going blanking pulses for application to the cathode of



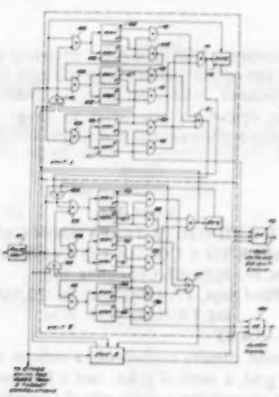
the vidicon tube and the second stage of which produces negative-going pulses for application to the grid of the vidicon tube, whereby the tube is blank during retrace by composite positive and negative pulses.

3,641,257

NOISE SUPPRESSOR FOR SURVEILLANCE AND INTRUSION-DETECTING SYSTEM

Elmer N. Taylor, Escondido, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 16, 1970, Ser. No. 3,407
Int. Cl. H04n *7/02*
U.S. Cl. 178—6.8 **9 Claims**



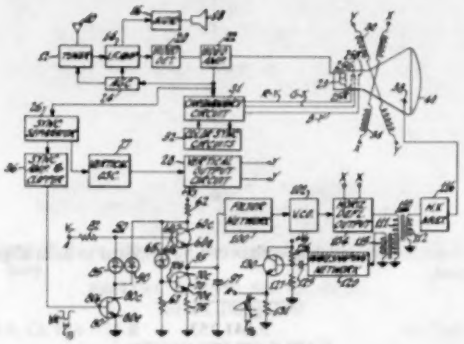
A surveillance and intrusion detection system is provided using a scanning-type sensor to monitor a field of view and transmit a video signal to a moving target indicator (MTI) the output of which is applied to an alarm system through a threshold level detector having a relatively low-threshold level for higher system sensitivity. A correlation unit minimizes false alarms which could occur from high-level noise by transmitting pulses to the alarm system only when they occur at approximately the same place in three successive scanning lines. Other units are provided for correlation of other possible moving targets in the same line. When transmitted pulses are added to the video signal from the sensor for display, the outline of a moving target is brightened.

3,641,258

SAMPLE-AND-HOLD CIRCUIT

Steven Alan Steckler, Clark, N.J., assignor to RCA Corporation

Filed June 29, 1970, Ser. No. 50,592
Int. Cl. H03k *5/20;* **H03b** *3/06;* **H04n** *1/36*
U.S. Cl. 178—73 R **10 Claims**



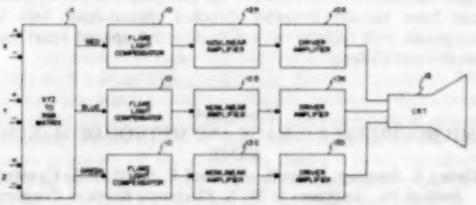
A sample-and-hold circuit employs first and second transistors having serially coupled collector-to-emitter current paths and including a negative feedback path coupling the collector of the first transistor to the base of the second transistor to provide a high-input impedance and a relatively low-output impedance circuit suitable for driving, for example, a capacitive load. The detector is keyed by means of a single keying transistor which provides a conduction path from the collector and the base of the first transistor to ground. Diodes coupled in series with the keying transistor and both the base and the collector of the first transistor insure that the first and second transistors are switched in and out of conduction simultaneously. The circuit may be employed as a phase comparator.

3,641,259

FLARELIGHT COMPENSATOR

Bernard D. Loughlin, Centerport, N.Y., assignor to Hazeltine Corporation

Filed Aug. 3, 1970, Ser. No. 60,443
Int. Cl. H04n *5/14*
U.S. Cl. 178—7.5 R **6 Claims**



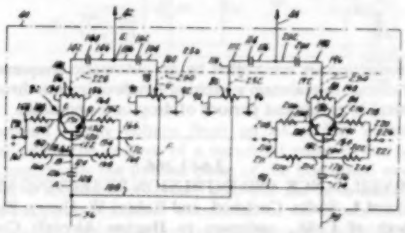
Disclosed is apparatus which compensates for the undesirable effect of flarelight in a graphic arts process simulator containing an image display device actuated by an image representative video signal. The effect of such flarelight is most perceptible when displaying high key images containing small dark areas, since in these images flarelight from the brighter parts of the image will illuminate the dark areas making them appear somewhat lighter than is indicated by the corresponding amplitude of the video signal. To compensate for this effect in one embodiment of the invention, signals are supplied to the display through a circuit which has less effective DC coupling than AC coupling in other words it

has a DC to AC transmission ratio less than unity. Thus the reference level for each signal, as applied to the display, is modified in relation to its average amplitude and therefore in relation to its average brightness. Signals representing high average brightness images (i.e., high key images) are established at a somewhat darker reference level than normal in order to tend to make the dark areas in the resulting displayed image darker than originally indicated, by an amount which offsets the effect of flarelight which tends to brighten these areas.

3,641,260
ELECTRONIC RASTER ROTATION SYSTEM FOR TELEVISION

John W. Herndon, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 21, 1970, Ser. No. 65,835
Int. Cl. H04n *3/22*
U.S. Cl. 178—7.7 **5 Claims**



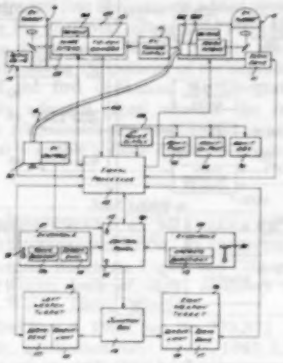
An electronic circuit used in a television system in conjunction with a television camera tube having electronic beam deflection means wherein the electronic circuit comprises a pair of mixing circuits actuated from the normal output signals of horizontal and vertical ramp generators and develops through adjustable zero centered potentiometer means, phase inverter means and capacitive coupling means composite output signals for application to the beam deflection means of the camera tube, each composite signal being variable in amplitude and phase by adjustment of said potentiometer means to achieve raster rotation and thereby simulate roll attitudes of an object being viewed by the camera tube, a further aspect of the invention residing in the utilization of two camera tubes and a video mixing circuit for providing a combined output signal for simulating relative motion of two pictures taken by the respective camera tubes.

3,641,261
NIGHT VISION SYSTEM

Richard W. Chaplin, Los Angeles; Donald J. Holscher, Playa Del Rey; Albert Wasney, Jr., Canoga Park, and Bryce A. Wheeler, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed June 4, 1969, Ser. No. 831,274
Int. Cl. H01j *29/89*
U.S. Cl. 178—7.8 **12 Claims**

Night-viewing apparatus for installation on a helicopter comprising two camera heads mounted on the front of the helicopter, and a pair of pivotally mounted mirrors or prisms for each camera head to enable it to view any portion of the terrain within a wide range of look-angles. One camera head includes an image intensifier cascaded with a television camera tube whose output is displayed on a television monitor, while the other camera head includes a set of image intensifiers whose output is coupled through a fiber optic bundle to an eyepiece. A control stick moved by the pilot can control the mirror positions for one camera system, while another control stick moved by the copilot can control the mirror positions for the other camera system. Both systems are inertially stabilized, with low-frequency disturbances being corrected by signals delivered to the mirror-pivoting motors and high-frequency components of disturbances being corrected by electron beam deflection coils at the image intensifiers. A pair of weapon turrets is mounted on

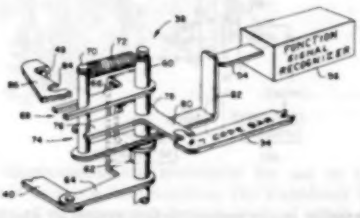


the helicopter, each carrying a gun and an infrared searchlight for use under very dark night conditions, and the weapon turrets can be slaved to point in the same direction being viewed at the monitor or eyepiece.

3,641,262
SHIFT CONTROL

Egon S. Babler, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 29, 1969, Ser. No. 888,732
Int. Cl. H04l *15/24, 15/34, 17/16*
U.S. Cl. 178—25 **10 Claims**



A teleprinter for printing indicia on a record medium in response to receipt of permutation signals of coded binary bits and having type elements in a type box with mechanism for two-dimensional positioning of the type box to bring selected-type elements into position for printing. Type box locations that are normally devoid of type elements and corresponding to nonprinting function code combinations are supplied with an additional font of type elements. A portion of the positioning mechanism is code responsively disconnected from received signals to print the additional font in response to received signals corresponding to other printing code combinations.

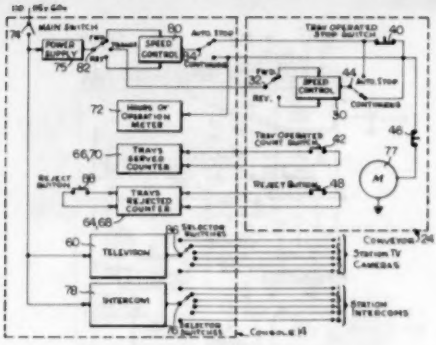
3,641,263
SUPERVISORY AND CONTROL SYSTEM FOR FOOD-HANDLING INSTITUTIONS

Delmar D. Rhoads, and Robert H. MacKay, both of Fort Wayne, Ind., assignors to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Aug. 24, 1967, Ser. No. 663,088
Int. Cl. H04n *7/18*
U.S. Cl. 178—6 **8 Claims**

A system is provided for supervising and controlling the preparation of foods and related activities in a food-handling institution. The system includes a console that provides visual

and audible communication with selected remote points in the food-handling institution. The system also includes a conveyor for transporting food and other articles under the control of the console or an operator at the conveyor.



3,641,264

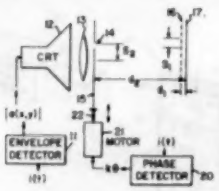
HOLOGRAM REPRODUCTION SYSTEM USING AN OPTICAL GRATING

Albert Macovski, Palo Alto, Calif., assignor to American Express Investment Management Company, San Francisco, Calif.

Filed Dec. 31, 1969, Ser. No. 889,392

Int. Cl. H04n *9/54, 9/60*

U.S. Cl. 178—6.5 **21 Claims**



A holographic image reconstruction system in which holographic light amplitude and phase information are resolved separately for reconstruction of the original hologram. The amplitude component is separately detected and reproduced on a cathode-ray tube or other electronically addressable optical display. The image of the amplitude component is projected through an external optical grating onto a film for recording or onto a real time imaging system. Phase information from the holographic data is separately detected and superimposed on the amplitude data by varying the phase of the shadow image of the optical grating on the amplitude image. Phase modulation of the image of the grating is accomplished by modulating the aperture or angle of the lens which images the amplitude pattern through the grating onto the film, or by modulating the grating itself.

3,641,265

TELEVISION RECORDING SYSTEM WITH ALTERNATE PERIOD INVERSION AND AUTOMATIC FREQUENCY CONTROL

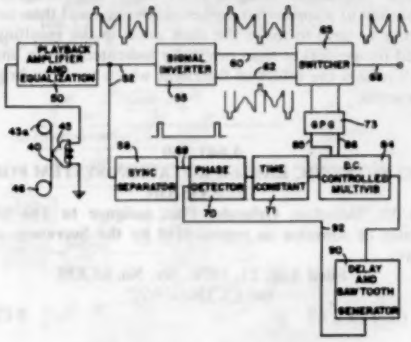
Kingston E. Ganske, Rough and Ready, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Oct. 27, 1969, Ser. No. 869,662

Int. Cl. H04n *5/12, 5/78, 7/12*

U.S. Cl. 178—6.6 A **15 Claims**

The signal for every other line in a television signal is inverted, and the resultant signal is magnetically recorded and reproduced. Reinversion (or demodulation) switching, to restore the played back signal to its original form for reproduction, is controlled by an automatic frequency control circuit to maintain switching synchronization through the vertical intervals and periods of drop outs and noise.



3,641,266

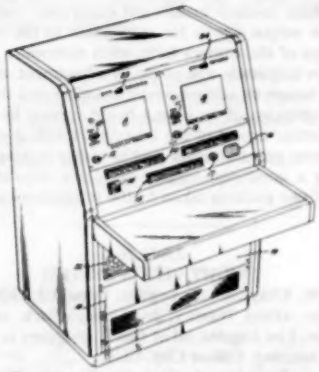
SURVEILLANCE AND INTRUSION DETECTING SYSTEM

Richard L. Stults, Carlsbad, and Robert W. Curry, Encinitas, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 29, 1969, Ser. No. 888,690

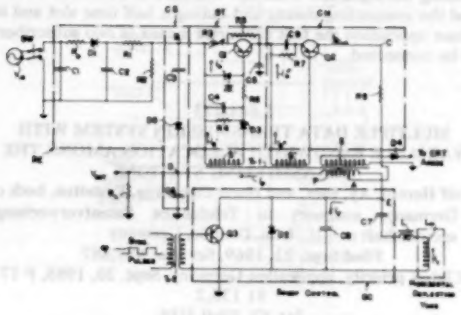
Int. Cl. H04n *7/18*

U.S. Cl. 178—6.8 **17 Claims**



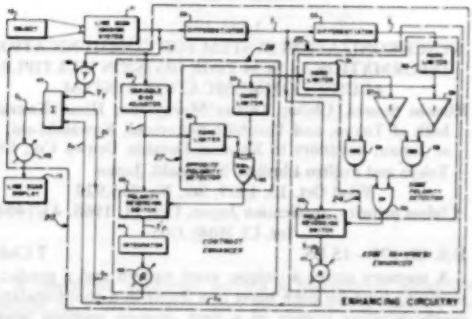
A surveillance and intrusion detection system is provided which embodies within a single electro-optical device located at one of many sites, surveillance motion detection and pictorial information with enhancement of the outline of a moving object once its presence is detected and an alarm signal is transmitted to a control station. Two lockout circuits receive alarm signals from the first two sites to detect a moving object and route composite video signals to display monitors. One full frame is stored for display by the monitor until an operator actuates an override switch for continuous monitoring of the site having the alarm condition, or any other site the operator may select for monitoring. Magnetic tape units are connected to the display monitors for storing pictorially the events at a site being monitored.

3,641,267
STABILIZED VOLTAGE-STEP-DOWN CIRCUIT ARRANGEMENT
Eugenio Cavallari, Milan, Italy, assignor to Ates Componenti Elettronici S.p.A., Milan, Italy
Filed July 29, 1969, Ser. No. 845,709
Claims priority, application Italy, Aug. 1, 1968, 19702
Int. Cl. H04n *5/44*
U.S. Cl. 178—7.3 R 9 Claims



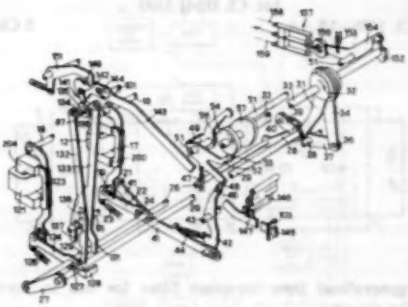
A rectified supply voltage from an AC utility outlet is chopped under the control of a recurrent pulse in the load circuit, specifically the flyback pulse of the horizontal sweep circuit of a television receiver, with the aid of a normally blocked chopping transistor connected to be unblocked by an intermittent biasing current from a secondary winding of a transformer whose primary winding acts as an inductance of a smoothing network for the chopped supply voltage. The resultant reduced output voltage is stabilized by the provision of a Zener diode in the input of either the chopping transistor or an ancillary transistor in series therewith.

3,641,268
REAL-TIME IMAGE CONTRAST AND EDGE SHARPNESS ENHANCING APPARATUS
Cyrus Beck, Abington, Pa., assignor to The United States of America as represented by the Secretary of the Navy
Filed July 24, 1969, Ser. No. 844,540
Int. Cl. H04n *5/14*
U.S. Cl. 178—7.3 R 16 Claims



Apparatus for enhancing contrast and edge sharpness of images visually displayed by a line scan imaging and display system wherein an electrical analog output signal of a line scan imaging system which may be degraded is processed in real time by enhancing circuitry producing corrective signals of adjustable magnitude for addition to the degraded signal to provide an enhanced brightness intensity modulating signal for a video display. The enhancing circuitry includes differentiating circuitry for obtaining the first and second derivatives of the degraded signal in turn applied to enhancer circuitry for causing the polarity of the first derivative to be always opposite to that of the second derivative so that the relative amplitudes of higher frequencies are emphasized. The polarity adjusted first derivative is added to the degraded signal to make the displayed image more crisp by reason of enhanced edge sharpness. A second polarity adjusted signal is developed by causing the polarity of the degraded signal to follow that of the first derivative. An integration of the second polarity adjusted signal wherein the relative amplitude of low frequencies are emphasized is added to the degraded signal to enable a visual display of greater contrast.

3,641,269
ELECTROMECHANICAL TRANSDUCER FOR SELECTING PRINTING ELEMENTS
Alessandro Cortona, Banchette Turin, and Giuseppe Calano, Mercenasco Turin, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Turin, Italy
Filed Nov. 6, 1968, Ser. No. 773,872
Claims priority, application Italy, Nov. 8, 1967, 53633 A/67
Int. Cl. H04l *15/24*
U.S. Cl. 178—27 18 Claims

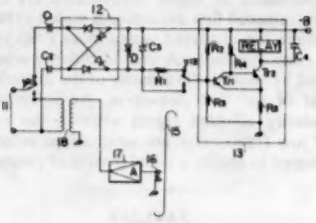


An electromechanical transducer for use as a printout device in an accounting machine. The transducer includes a plurality of electromagnet devices, each of which comprises an armature. The devices are selectively energizable to hold the armatures in a first position. A control member is shiftable cyclically in a first direction for moving the armatures into their first positions at the instant when the devices are selectively energized by a preset code store. Thereafter, the member is moveable in a second direction to signal the conditions of the devices (energized or deenergized as determined by the positions of the armatures) and thereby set a number of corresponding code bars which determine the character to be printed.

3,641,270
TIMER CIRCUIT OF AN AUTOMATIC TELEPHONE-ANSWERING APPARATUS
Haruhiko Ohshima, Kawasaki; Hiroshi Mizuno, Nagareyama; Akira Konno, Tokyo, and Tomoaki Kosaka, Yachiyo, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed June 11, 1970, Ser. No. 45,533
Claims priority, application Japan, June 11, 1969, 44/54902
Int. Cl. H04m *11/10*
U.S. Cl. 179—2 A 3 Claims

A timer circuit for controlling the operation of an automatic telephone-answering apparatus, in which a condenser of a RC timer circuit is not charged with the current of a DC source but is charged with a rectified ringing current and

then gradually discharged. During the discharging period, a switching circuit is continuously kept in the ON state thereby



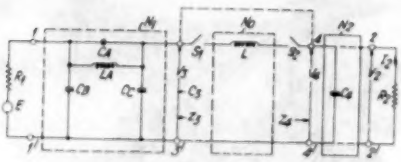
causing the automatic telephone-answering apparatus to operate.

3,641,271

RESONANT TRANSFER CIRCUITS

Alfred Leo Maria Fettweis, Mol, Belgium, assignor to International Standard Electric Corporation

Filed June 22, 1970, Ser. No. 48,956
Claims priority, application Netherlands, Mar. 25, 1966, 6603926
Int. Cl. H04j *3/00*
U.S. Cl. 179—15 AA 5 Claims



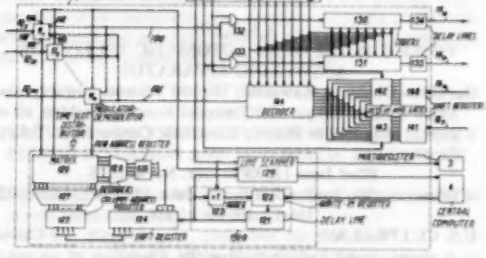
A generalized time invariant filter for use in resonant transfer circuits.

3,641,272

TIME DIVISION AUTOMATIC TELEPHONE SWITCHING EQUIPMENT

Andre E. Pinet, 22, Rue Emile Le Gac, and Raymond P. Gouttebel, 10, Ruedes Freres Lumiere, both of 22 Perros-Guirec, France

Continuation-in-part of application Ser. No. 701,247, Jan. 29, 1968, now abandoned. This application Oct. 6, 1970, Ser. No. 90,185
Claims priority, application France, Feb. 21, 1967, 95799
Int. Cl. H04j *3/00*
U.S. Cl. 179—15 AT 2 Claims



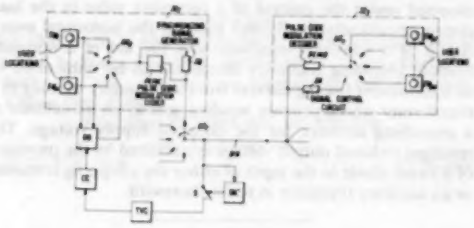
Time division, pulse code modulation switching system comprising a plurality of modulation-demodulation units or concentrator units, each including first converter means connected to subscribers for converting analog signals to pulse amplitude modulation signals and ensuring the inverse conversion, a pair of second converter means for converting said pulse amplitude modulation signals to pulse code modulation signals and ensuring the inverse conversion, two pairs of group highways connected to said pair of second converter means and each including a send group highway and a receive group highway, means for selectively connecting together the send group highway of a pair to the receive group highway of the other pair and means for selectively activating during a full time slot the second converter means and the connecting means and during a half time slot and in phase opposition the first converter means of two subscribers to be connected.

3,641,273

MULTIPLE DATA TRANSMISSION SYSTEM WITH VARIABLE BANDWIDTH ALLOCATION AMONG THE TRANSMITTING STATIONS

Wolf Herold, Ay, Iller, and Horst Ohnsorge, Erstetten, both of Germany, assignors to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm, Danube, Germany

Filed Sept. 22, 1969, Ser. No. 859,887
Claims priority, application Germany, Sept. 20, 1968, P 17 91 135.2
Int. Cl. H04j *3/16*
U.S. Cl. 179—15 BA 5 Claims



In a multiplex data transmission system including several stations connected to a common transmission path and each serving a plurality of independent users, with each user being assigned an individual channel and each station being assigned a portion of the total transmission path capacity, means are provided for varying the size of the portion available to each station in accordance with the number of its users actually desiring to use the transmission path.

3,641,274

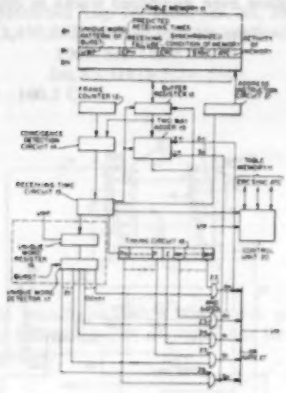
SYNCHRONIZATION SYSTEM FOR COMMUNICATION INFORMATION IN PCM TIME DIVISION MULTIPLE ACCESS COMMUNICATION SYSTEM

Hiroshi Sasaki, Chiba; Tatsuo Maruyama; Hisao Kanzaki, both of Tokyo, and Yasuhiko Sakamoto, Kawasaki-shi, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo and Fujitsu Limited, Kawasaki, Japan

Filed Oct. 13, 1969, Ser. No. 865,922
Claims priority, application Japan, Oct. 11, 1968, 43/74042
Int. Cl. H04j *3/06*
U.S. Cl. 179—15 BS 7 Claims

A memory stores a unique word pattern and a predicted receiving time for each burst in a frame in a communication synchronization system of a time division multiple access communication system. A counter counts the timing of a frame. A coincidence detection circuit couples the counter to a receiving time circuit and determines coincidence between the count of the counter and the predicted receiving time stored in the memory and actuates the receiving time circuit when coincidence is detected. A unique word register stores the unique word pattern. A unique word detector having outputs and an input is coupled to the receiving time circuit via the unique word register and determines coincidence

between the unique word pattern and the unique word pattern of a received burst. The unique word detector is initiated in operation by a signal from the receiving time circuit. A correcting circuit coupled to the outputs of the



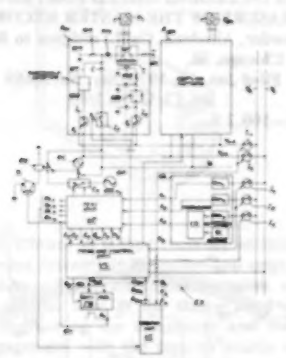
unique word detector determines a deviation between the time of reception of the burst and the predicted receiving time and corrects the predicted receiving time in accordance with the deviation.

3,641,275

AUTOMATIC CIRCUIT-TESTING MEANS FOR TIME-SHARING TELECOMMUNICATION SYSTEM

Aldo Perna, and Giorgio De Varda, both of Milan, Italy, assignors to Societa Italiana Telecommunicazioni Siemens S.p.A., Milan, Italy

Filed Dec. 15, 1969, Ser. No. 884,920
Claims priority, application Italy, Dec. 14, 1968, 25065 A/68
Int. Cl. H04m *3/08*
U.S. Cl. 179—15 BF **14 Claims**



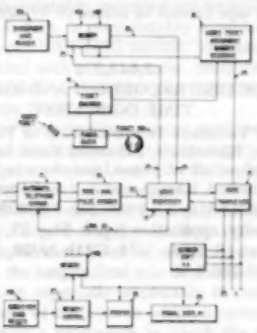
A telephone exchange serving a plurality of subscriber groups on a time-sharing basis has an address memory (N) for the code numbers of called (or calling) subscribers and a monitoring memory (P) operating in step therewith to register operational code words in corresponding time slots, there being 100 such time slots of 1 μsec. duration in each memory for the establishment of several service phases (0_{ss}, 0_{s1}, 0_{s2}, 0_{sn}) and a multiplicity of communication phases (0_{s4}–0_s) allowing for up to 96 simultaneous conversations over a communication path including a voice lead (V_s) and a signal lead (V_s) from which respective branches (V_{sA}, V_{sB}) extend to each of the several subscriber groups. During a service phase (0_{s1}) of a cycle in which no caller requests the transmission of ringing current to any called subscriber associated with the exchange, a ringing circuit (V_r) common to all subscriber groups is energized from an audiofrequency generator (GH) for the testing of the voice and signaling circuits of an idle subscriber identified by a code entered in the corresponding time slot of the address memory, the tests proceeding under the control of code words in the same time slot of the monitoring memory which is stepped upon the successful completion of any test. If the subscriber line is found intact, the counter represented by the service phase (0_{s1}) of the address memory is stepped to register the next higher (or next lower) code number for the testing of another idle subscriber; if a defect is ascertained, an alarm signal is generated which in certain cases inhibits the establishment of any connection between the communication path and the group containing the affected subscriber.

3,641,276

AUTOMATIC ELECTRONIC PAGING SYSTEM

Michael I. Keller, 4112 South 36th St., Arlington County, Va., and Dayne G. Gardner, Springfield, Va., assignors to said Keller by said Gardner

Filed Sept. 29, 1969, Ser. No. 861,964
Int. Cl. H04m *11/00*
U.S. Cl. 179—18 BF **8 Claims**



Disclosed herein is an automatic electronic paging system. Each subscriber is identified by a unique identification code which is selectively converted to a supplemental identification code upon a subscriber entering a paging area. The supplemental identification codes are unique within each paging area but not unique within the overall paging system. A plurality of sensor units are located within each paging area, each of the sensor units having temporarily and selectively stored therein a supplemental code corresponding to one of the unique identification codes identifying a subscriber within the paging area. The paging signal, in the form of a unique identification code is sent to the paging area where it is converted to a corresponding assigned supplemental identification code. The supplemental code is transmitted to all sensors in the area with a paging signal being generated at the one sensor containing the transmitted supplemental code. In response to the receipt of a paging signal, a subscriber can send an acknowledgment code to the pager.

3,641,277

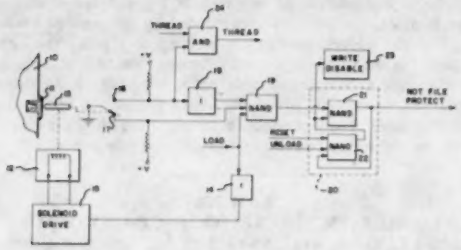
FILE PROTECT SYSTEM FOR MAGNETIC TAPE UNIT WITH SOLENOID FOR SENSING PRESENCE OR ABSENCE OF REEL RING

Ronald R. Campbell, Boulder, and Roger A. Monroe, Longmont, both of Colo., assignors to Storage Technology Corporation, Boulder, Colo.

Filed Apr. 27, 1970, Ser. No. 32,001
Int. Cl. G11b *15/04*
U.S. Cl. 179—100.2D **4 Claims**

In a magnetic recording and reproducing unit the magnetic heads are enabled to write or erase a magnetic tape only if a

reel ring is inserted in the reel of magnetic tape. The file protect system includes a solenoid which is momentarily energized after a reel is placed in the unit. The solenoid moves a plunger into a position which senses the presence or absence of a reel ring. The plunger momentarily actuates switch contacts if the plunger contacts a reel ring. The switch contacts



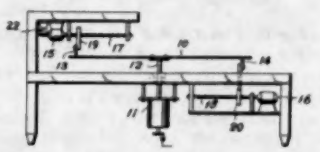
set a latch having an output which enables the write and erase heads only if the latch is set. The file protect system is fail-safe because the latch is always reset when power is turned on or when a reel is removed. If there is failure of the file protect system the latch will remain reset insuring that the magnetic tape cannot be erased or written upon.

3,641,278

MAGNETIC DISC RECORDING AND REPRODUCING TIME INDICATOR

Hisao Kinjo; Yoshitaka Iwabuchi, both of Yokohama; Seiichi Takashima, Kamakura; Takatoshi Kato, and Keigo Okano, both of Tokyo, all of Japan, assignors to Victor Company of Japan Limited, Kanagawa-ku, Yokohama, Japan

Filed May 27, 1969, Ser. No. 828,222
Claims priority, application Japan, May 29, 1968, 43/36029
Int. Cl. H04n *5/78;* G11b *21/04, 27/36*
U.S. Cl. 179—100.2 M 3 Claims



A recording and reproducing time indicator in a magnetic recording and reproducing apparatus which makes magnetic recording and reproduction by linear movement of magnetic heads in contact with a rotary magnetic medium. The indicator comprises a time indication part having a scale showing the position of magnetic heads into time, a pointer for indicating a scale on said time indication part, and a pointer driving means for moving said pointer in response to the position of magnetic heads moved by the head moving means.

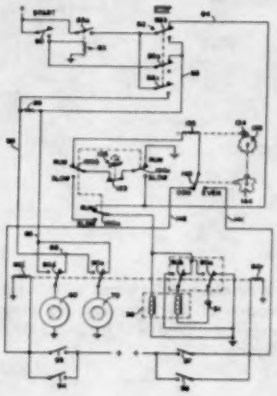
3,641,279

REVERSIBLE TAPE TRANSPORT WITH INTERLOCKED HEAD POSITION AND TAPE DIRECTION CONTROL

Kingston E. Ganske, Rough and Ready, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Oct. 24, 1969, Ser. No. 869,085
Int. Cl. G11b *21/08*
U.S. Cl. 179—100.2MD 5 Claims

A reversible tape transport moves a record tape, such as magnetic recording tape, between two rolls which function alternately as supply and takeup Rolls. One or more magnetic recording and/or reading transducers scan longitudinally independent parallel tracks on the tape. Mechanism for locating the heads in alignment with desired tracks is interlocked with the drive for the transport such that the transducers will follow even numbered tracks in one direction,



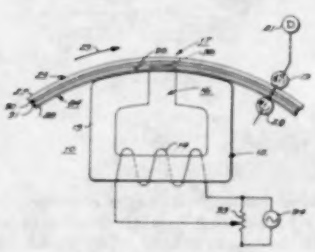
and odd numbered tracks in the other direction of movement of the tape, and the positioning mechanism is self-correcting in the event that it should get out of phase with this desired relationship.

3,641,280

APPARATUS FOR CONTACT COPYING MAGNETIC RECORDS INCLUDING SHIELD FOR PREVENTING ERASURE OF THE MASTER RECORD

Lewis B. Browder, Altadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 19, 1970, Ser. No. 3,659
Int. Cl. G11b *5/86*
U.S. Cl. 179—100.2 E 7 Claims

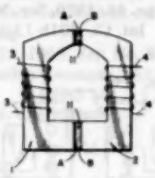


An apparatus for copying a magnetic record from a magnetic master with the assistance of anhysteretic magnetic fields includes a medium for setting up countermagnetic fields which oppose the anhysteretic magnetic fields and prevent erasure of the magnetic record.

3,641,281
MAGNETIC TRANSDUCER HAVING A CONDUCTIVE METAL POWDER GAP SPACER

Peter F. Varadi, 10500 Rockville Pike, Rockville, Md., and Laslo G. Sebestyen, 41 Ash Bourne Road, Esling, London W.5, England

Original application Aug. 18, 1964, Ser. No. 390,435, now Patent No. 3,495,045. Divided and this application Nov. 28, 1969, Ser. No. 870,293
Int. Cl. G11b *5/24, 5/42*
U.S. Cl. 179—100.2 C 1 Claim

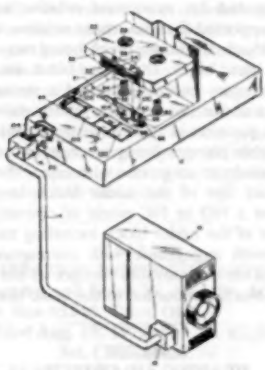


A magnetic transducer with a conductive gap spacer of metal powder intermixed with a suitable flux for bonding the pole faces together.

3,641,282
CONTROL APPARATUS FOR A TAPE DRIVE

William A. Martin, Fairport, and Marvin S. Bielicki, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 31, 1969, Ser. No. 872,922
Int. Cl. G11b *23/44*; G03b *31/00*
U.S. Cl. 179—100.2 S 6 Claims

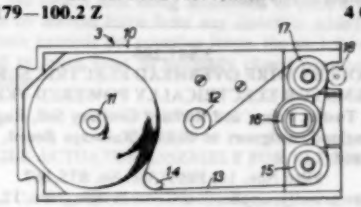


An override control in a tape recorder includes a motor, tape drive means driven by the motor and engageable with the tape to advance it past a transducer station, a transducer engageable with the tape at the station, and an actuating member for positioning the transducer and the tape drive means in engagement with the tape to enable operation of the recorder by turning on the motor. The override control is provided for selectively enabling and disabling the tape drive when the motor is operating and the actuating member has positioned the transducer in engagement with the tape to adapt the recorder to fast start/stop operation which is useful in the recording of synchronized sound motion pictures. Preferably, the override control is actuated in response to insertion of a plug into a jack provided on the recorder. In a recorder of the type in which a spring-loaded pressure roller presses the tape against a capstan to advance the tape, the override control may comprise means for selectively disabling the spring biasing the pressure roller to permit a solenoid to selectively control the engagement and disengagement of the pressure roller against the tape and capstan.

3,641,283
SHIM ADJUSTABLE PRESSURE MEMBERS FOR MAGNETIC TAPE TRANSDUCING DEVICES

Edric Raymond Brooke, Bishops Stortford, England, assignor to English Numbering Machines Limited, Enfield, England

Filed Oct. 17, 1969, Ser. No. 867,280
Claims priority, application Great Britain, Oct. 23, 1968, 50,339/68
Int. Cl. G11b *15/28, 23/04*
U.S. Cl. 179—100.2 Z 4 Claims



A pressure member for pressing a magnetic tape against the tape head of a magnetic tape transducing device is disclosed. The pressure member comprises a rotatable ring of resilient material which is urged towards the tape head so as to compress the resilient material.

Preferably, the ring of resilient material is supported around the circumference of a hollow cylinder of rigid material which is rotatably mounted on an inner stationary cylinder which, in turn, is nonrotatably mounted on a fixed shaft having a noncircular cross section. The inner stationary cylinder is provided with a noncircular, preferably rectangular, axial bore which is complementary to the noncircular cross section of the fixed shaft.

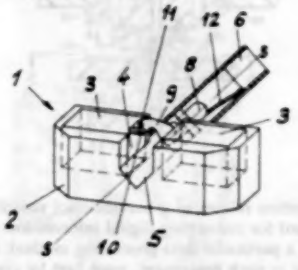
The rectangular complementary cross sections of the fixed shaft and the axial bore of the inner stationary cylinder are so arranged that gaps are formed between walls of the shaft and walls of the complementary rectangular bore. The spacing between the ring of resilient material and the tape head is adjusted by placing shims in the gaps so as to vary the position of the ring of resilient material in a direction or directions perpendicular to the longitudinal axis of the shaft.

The invention is especially applicable to magnetic tape transducing devices of the kind in which a cassette is operatively engageable in a receptacle in which the tape head is mounted, the pressure member being mounted on the cassette and the resilient ring being urged towards the tape head when the cassette is operatively engaged in the receptacle.

3,641,284
MAGNETIC PHONOGRAPH PICKUP HAVING PLURAL INDUCING MAGNETS

Hugo Westerkamp, Prechtal, Germany, and Robert Dubois, Colombiar, Switzerland, assignors to Huber & Co., Hautervie, Switzerland

Filed Dec. 15, 1969, Ser. No. 885,391
Claims priority, application Switzerland, Dec. 16, 1968, 18718/68; Nov. 13, 1969, 16922/69
Int. Cl. H04r *11/12*
U.S. Cl. 179—100.41K 10 Claims



A magnetic phonograph pickup comprises interfitting stylus and sensing assemblies. The stylus is connected to a fer-

romagnetic element which is magnetically saturated by at least a pair of permanent magnets which are arranged, in a common plane at right angles to the plane of symmetry through the stylus assembly, adjacent this element with similar poles directed toward it. The sensing arrangement comprises coils adjacent the element which sense its movement and produce an output signal. The entire pickup is symmetrical about a central plane of symmetry, and the magnets are inclined to this plane.

3,641,285

TROLLEY WIRE OVERHEAD ELECTRIC SUPPLY SYSTEMS FOR ELECTRICALLY POWERED VEHICLES

Arnold Tustin, Tring, and Richard Geoffrey Sell, Rugby, both of England, assignors to British Railways Board, London, England

Filed Nov. 10, 1969, Ser. No. 875,167
Claims priority, application Great Britain, Nov. 12, 1968, 53,628/68
Int. Cl. B60m *1/20*
U.S. Cl. 191—40 3 Claims

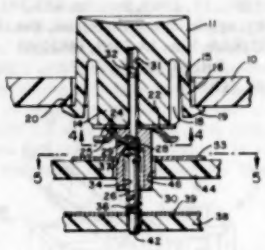
A trolley wire overhead electric supply system, for supplying power for the propulsion of electric vehicles, comprises a contact wire which is directly supported at each supporting mast through a spring. The spring is associated with an abutment so arranged that for an upward force below a predetermined value acting on the spring through the contact wire, the contact wire is relatively stiffly connected to the mast and, for an upward force above said predetermined value acting on said spring through said contact wire, the contact wire is relatively softly connected to said mast.

3,641,286

ELECTROMECHANICAL KEYBOARD INDEPENDENTLY OPERATED SWITCH MECHANISM WITH IMPROVED CONDUCTIVE RESILIENT ACTUATING MEANS

Jaroslaw Berezowski, Greenwich, Conn., assignor to Selectro Corporation, Mamaroneck, N.Y.

Filed Oct. 5, 1970, Ser. No. 77,900
Int. Cl. H01h
U.S. Cl. 200—5 A 4 Claims



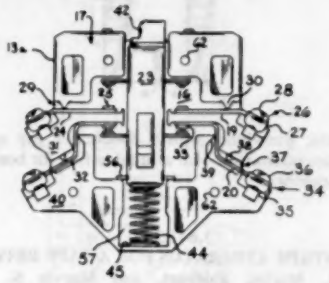
This invention relates to a multicontact switch in its form of a keyboard for converting digital information into a code, suitable for a particular data processing method. Information to be usable in such equipment, must first be converted into a code, suitable for use with the particular processing method. There are various codes in common use, such as numeric code, alphanumeric, binary, decimal-binary which is coded with or without auxiliary functions, duodecimal, hexidecimal binary code, etc. Although an apparatus having keys is used for this purpose, the actual coding is generally done by complex electronic devices resembling a code generator.

3,641,287

SWITCHING DEVICE FOR ELECTROMAGNETIC MOTOR STARTERS

Philip G. Hughes, Bloomington, Ill., assignor to General Electric Company

Filed Apr. 16, 1970, Ser. No. 29,062
Int. Cl. H01h *13/52*
U.S. Cl. 200—16 A 8 Claims



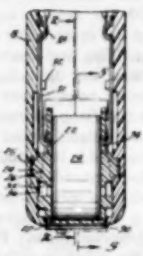
A switching device for motor starters comprising a basic block and as required one or more adder blocks, the basic block being mountable on the side of a contactor and having two electrically separate circuits, one NO and one NC, the basic block including two pairs of stationary contact tips and two pairs of movable contact tips cooperable therewith, the latter being mounted for movement relative to a plunger which itself is supported for movement relative to the housing of the basic block, the adder block being mountable to an end wall of the basic block, the adder block including both NO and NC stationary contact tips and a movable plunger which supports a convertible contact tip for movement relative thereto, the position of the convertible contact tip relative to the movable plunger being arrangeable such that the former may be made to cooperate with either the NO or NC stationary contact tips of the adder block to provide the latter with either a NO or NC mode of operation, and the movable plunger of the adder block including means formed integrally therewith engageable with corresponding means suitably provided on the movable plunger of the basic block when the adder block is mounted to the basic block.

3,641,288

HEARING AID SWITCH

Paul F. Lamp, Casselberry, Fla., assignor to Electone, Inc., Winter Park, Orange County, Fla.

Filed June 1, 1970, Ser. No. 42,339
Int. Cl. H01h *21/00*
U.S. Cl. 200—52 5 Claims



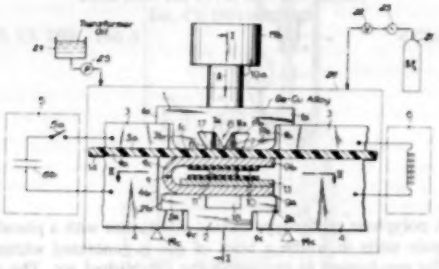
A hearing aid apparatus is provided having a case with a rotatably mounted battery compartment for holding a battery

and having spring contacts for making electrical contacts with a battery held in the battery compartment. The battery compartment includes means for disengaging electrical contacts when the battery compartment is not fully closed thereby operating an on-off switch.

3,641,289
HIGH-CURRENT HIGH-VOLTAGE SWITCH WITH INCISOR ELECTRODE

Petros Dokopoulos, Juelich, Germany, assignor to Kernforschungsanlage Juelich Gesellschaft mit beschrankter Haftung, Juelich, Germany

Filed Oct. 21, 1969, Ser. No. 868,192
Claims priority, application Germany, Oct. 23, 1968, P 18 04 609.8
Int. Cl. H01h *39/00*
U.S. Cl. 200—61.08 14 Claims

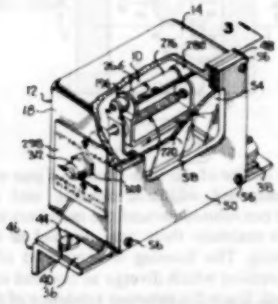


A rapid-action switch, especially for the switching of high voltages and currents in plasma physics, magnetohydrodynamics and like technologies in which an explosive force is produced by discharge through a consumable electrode within a U-shaped aluminum body separated from a switching electrode bearing a sharp edge and sandwiched between this electrode and a counterelectrode constituting an anvil. An insulating layer between the proximal leg of the aluminum U and the sharp edge is pierced as this leg is deformed by the exposure to bring the edge into contact with the U and thereby close the circuit.

3,641,290
VIBRATION-RESPONSIVE SWITCH

Frank W. Murphy, and Frank W. Murphy, Jr., both of 3131 S. Sheridan, Box 45248, Tulsa, Okla.

Filed Aug. 10, 1970, Ser. No. 62,336
Int. Cl. H01h *35/14*
U.S. Cl. 200—61.45 14 Claims



A switch for opening and closing electric circuits, the switch comprising a pivotally mounted switch arm normally disposed in switch closed position, magnet coupling means for holding said switch arm in its closed position, means exerting a biasing force on said switch arm constantly tending to urge said switch arm for movement to an open position, the coupling force exceeding the biasing force, said switch arm forming a first moment of inertia arm, and a weighted lever assembly forming a second moment of inertia arm, said weighted lever assembly being connected with the switch arm, and the switch arm being assembled in such a manner that when an inertial force from any direction added to the biasing force exceeds the coupling force, the switch arm will be caused to move from its normally closed position to its open position.

3,641,291
TOGGLE ACTUATOR ASSEMBLY FOR ELECTRIC SWITCH

Conrad I. Carling, W. Hartford, Conn., assignor to Carling Electric, Inc., West Hartford, Conn.

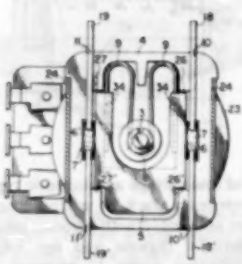
Filed Apr. 7, 1971, Ser. No. 131,911
Int. Cl. H01h *13/28*
U.S. Cl. 200—67 G 9 Claims

A novel toggle handle actuator structure for an electrical switch wherein means are provided to prevent relative axial rotation between the toggle handle and the actuator while they perform their pivoting function in switching electrical circuits.

3,641,292
PULL-PUSH-TYPE SWITCH

Heiroku Tanaka, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 27, 1970, Ser. No. 93,376
Claims priority, application Japan, Nov. 28, 1969, 44/114138; June 5, 1970, 45/55893; 45/55894; 45/55895; 45/55896; 45/55897; 45/55898; 45/55899
Int. Cl. H01h *15/18*
U.S. Cl. 200—76 9 Claims



A pull-push-type switch having a movable contact coupled by hairpinlike spring means to a pull-push switch shaft and a

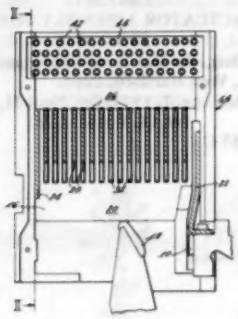
plurality of pairs of fixed contact strips, which permits the switching of many circuits and is mainly used in association with a variable resistor unit.

3,641,293

ARC CHUTE PLATES FOR AIR CURCUIT BREAKER

Charles H. Armitage, Wauwatosa, Wis.; Henry L. Peek, Wellesley, and Herbert M. Pflanz, Westwood, both of Mass., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 8, 1970, Ser. No. 1,443
Int. Cl. H01h *33/08*
U.S. Cl. 200—144 R 2 Claims



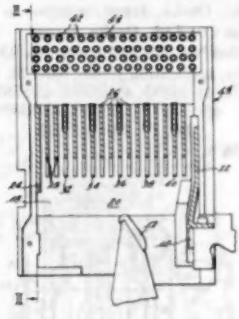
The arc chute of a low-voltage air magnetic-type electric circuit breaker comprising a stack of spaced-apart porous metal plates made of fiber metal. All of the plates are impregnated or coated with ceramic insulating material at least on their lower regions.

3,641,294

ARC CHUTE FOR AIR CIRCUIT BREAKER

Charles H. Armitage, Wauwatosa, Wis.; Henry L. Peek, Wellesley, and Herbert M. Pflanz, Westwood, both of Mass., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Jan. 8, 1970, Ser. No. 1,373
Int. Cl. H01h *33/08*
U.S. Cl. 200—144 R 2 Claims



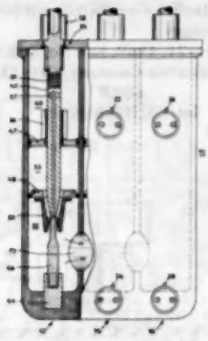
The arc chute of low-voltage air magnetic type electric circuit breaker comprises a stack of spaced-apart steel plates. Some of the plates are coated with ceramic insulating material on their uppermost regions and are located between groups of the uncoated plates to increase the electrical breakdown path and inhibit flashover at the upper end of the arc chute where exhaust gases are hottest.

3,641,295

POLYPHASE CIRCUIT INTERRUPTER OF THE FLUID BLAST PUFFER-TYPE

Jean-Yves Ferton; Jacques Hennebert, and Francois Strippoli, all of Grenoble, France, assignors to Merlin Gerin, Societe Anonyme, Grenoble, France

Filed June 30, 1970, Ser. No. 51,313
Int. Cl. H01h *33/88*
U.S. Cl. 200—148 A 14 Claims



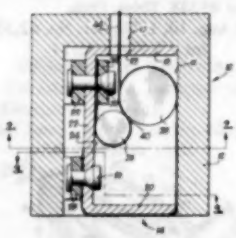
A polyphase puffer-type circuit interrupter with a plurality of pole units in which a blast of gas is generated within a puffer mechanism to extinguish the established arc. The gas under pressure flows out of a blast orifice and escapes in a downstream compartment. All downstream compartments of the different pole units communicate with each other so as to increase the flow of the blast gas.

3,641,296

ROLLER-BAND DEVICE WITH DIVERGING WALLS BIASING MEANS

Karl H. Schwarz, Fairway, Kans., assignor to Puritan-Bennett Corporation, Kansas City, Mo.

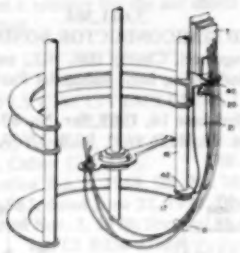
Filed July 2, 1970, Ser. No. 51,836
Int. Cl. H01h *3/32*
U.S. Cl. 200—153 R 13 Claims



A roller-band device of the type wherein a pair of rotatable members are disposed within a housing and a flexible, resilient band is convoluted around the members in S-shaped configuration to maintain their axes parallel as they move within the housing. The housing is comprised of two non-parallel planar sections which diverge as one end of the housing is approached. Since the inherent tendency of the flexible band to return to a linear position decreases with divergence of the planar sections, the two rotatable members are always biased in the direction of divergence of the wall sections. An end wall, which is spaced from the point of closest proximity

of the planar sections, is bendable about a fulcrum point and the flexible band is trained around this wall, under tension, when the rotatable members are disposed adjacent thereto. A control band element is coupled to the flexible band for shifting the rollers toward the end of the housing where the opposed planar sections converge. As the members are moved away from the pivotal end wall, tension on the flexible band increases as the end wall is biased about its fulcrum point in the direction of movement of the members. Return movement of the members in the direction of divergence of the planar sections decreases the tension on the flexible band but movement of the end wall assures that the flexible band remains taut.

3,641,297
SWITCH APPARATUS
Daniel G. Bowers, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 16, 1970, Ser. No. 98,809
Int. Cl. H01h *9/00*
U.S. Cl. 200—166 A **4 Claims**

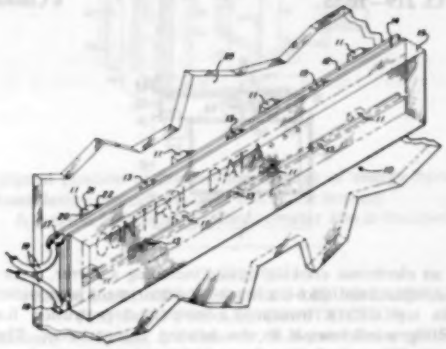


A simple solution to a longstanding, vexing problem of telephone switches is disclosed. By flexing a smooth, flat member between spaced-apart points on a switch frame, the member bows into a fender that prevents rubbing and chafing of movable wires within such frame. Attendantly, crosstalk and maintenance problems are (virtually) eliminated.

3,641,298
ELECTRICALLY CONDUCTIVE MATERIAL AND ELECTRICAL CONTACT
Irwin Broverman, Chicago, Ill., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.
Filed July 19, 1967, Ser. No. 654,604
Int. Cl. H01b *1/00*
U.S. Cl. 200—166 C **16 Claims**

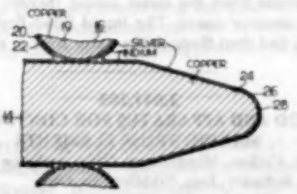
An electrically conductive material consisting of a metal that forms a nonprotective surface film in an air atmosphere, and a metal compound capable of providing a reducing atmosphere at the working face of the material when operating in the atmosphere.

3,641,299
DISPLAY FACEPLATE SWITCH
William N. Mayer, White Bear Lake, Minn., assignor to Control Data Corporation, Minneapolis, Minn.
Filed Feb. 10, 1971, Ser. No. 114,283
Int. Cl. H01h *9/16*
U.S. Cl. 200—167 R **13 Claims**



A switch having a transparent area and suitable for placing over a video display without obscuring the information displayed beneath the switch. The switch comprises an elastically bendable conducting strip which, when a top transparent member of the switch is pushed, is forced into contact with a conducting area on the top transparent member. The natural elasticity in the bendable strip serves to break the contact between the conducting area and the bendable strip when the switch is released.

3,641,300
ELECTRICAL CONTACT
Allen R. Nitz, Wauwatosa, Wis., assignor to Allis Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Aug. 15, 1969, Ser. No. 850,580
Int. Cl. H01b *1/02*
U.S. Cl. 200—166 C **3 Claims**



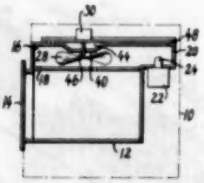
In an electrical contact arrangement wherein a disconnect assembly having one or more spring loaded electrically conductive contact fingers which slidably engage and disengage from an electrically conductive stud. The fingers and stud are made of copper and the engaging surfaces are provided with a layer of silver and a layer of indium on the silver. The indi-

um layer being on the order of 0.1–1.5 mils thick and diffused along its boundary layer to the silver by heat treatment (160° C. for 2 hours).

3,641,301
MICROWAVE OVEN

Hiroshi Ikeda, Shizuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 8, 1970, Ser. No. 70,293
Claims priority, application Japan, Sept. 10, 1969, 44/86079
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 **6 Claims**

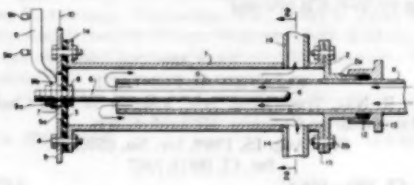


In an electronic cooking device including a stirrer, a stirring compartment above a heating compartment is provided on its top with a truncated cone-shaped protrusion for reflecting a microwave to the heating compartment. The stirrer is disposed adjacent the end of the protrusion to direct the microwave toward the heating compartment.

3,641,302
APPARATUS FOR TREATING LIQUIDS WITH HIGH-FREQUENCY ELECTRICAL ENERGY

Ralph G. Sargeant, 408 West Windsor St., Lakeland, Fla.

Filed Mar. 18, 1970, Ser. No. 20,754
Int. Cl. H05b *5/00, 9/06*
U.S. Cl. 219—10.65 **5 Claims**



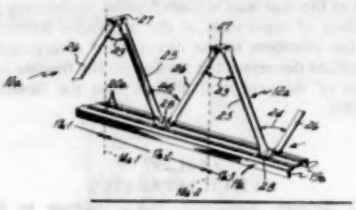
An apparatus for heating liquids by high-frequency energy composed of an outer casing, an inner longitudinally disposed central electrode, and a cylinder separating the inner electrode from the outer casing thereby forming two concentric annular zones. The liquid flows first through the inner zone, and then through the outer zone in series.

3,641,303
METHOD AND APPARATUS FOR CONTINUOUSLY MAKING TRUSS ELEMENTS

Howard W. Collins, Middletown, Ohio, assignor to Integrated Building Industry, Inc., Middletown, Ohio

Filed Jan. 26, 1970, Ser. No. 5,732
Int. Cl. B23k *1/00*
U.S. Cl. 219—56 **40 Claims**

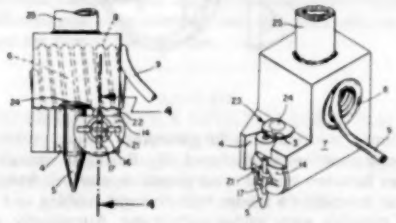
A method and apparatus for continuously making truss elements in successively formed unit lengths from supplies of web forming and chord-forming strip. A unit length of supporting web is shaped at a die station while in position overlying a longitudinal portion of chord member formed of the chord forming strip. The web is joined at a welding station by resistance welding to the chord. The shaping of the unit length of web imparts to the web a pair of alternate opposite bends separated by straight portions. The bends include flat portions for joining to chord members and the straight portions between the bends are shaped to a curved cross section to provide rigidity. The chord member is provided with outwardly projecting ribs which melt to form the weld when pressed between resistance welding electrodes. The forming dies and welding heads move from the path of the truss element as the truss element is intermittently advanced by a three-latch advancing mechanism.



3,641,304
HEATED SEMICONDUCTOR BONDING TOOL

Thomas L. Angelucci, Cherry Hill, N.J., assignor to Kulicke and Soffa Industries, Inc., Industrial Park, Fort Washington, Pa.

Filed June 16, 1969, Ser. No. 833,408
Int. Cl. H05b *1/00;* **B23k** *21/00, 3/00*
U.S. Cl. 219—85 **9 Claims**



A high-efficiency heated bonding tool having a heat sink with a plurality of recesses therein for receiving a replacable heating element and a bonding nib, at least one recess comprising a helical thread into which is fitted a helical coil heating element wound as a spring having a diameter which would cause an interference fit with the helical thread, but when flexed to fit the helical thread provides a radial force for tight surface-to-surface engagement with the helical thread.

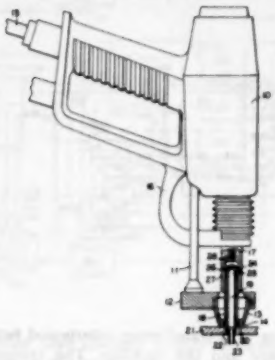
3,641,305
SPUD WELDING METHOD

Ralph Kenneth Ritter, Moorestown; Charles C. Pease, Pennsauken, and Elliott J. Fay, Willingboro, all of N.J., assignors to Omark Industries, Inc., Portland, Oreg.

Original application Mar. 3, 1969, Ser. No. 803,851, now Patent No. 3,508,028, dated Apr. 21, 1970, which is a continuation-in-part of application Ser. No. 633,844, Apr. 26, 1967, now Patent No. 3,555,238, dated Jan. 12, 1971.
Divided and this application Apr. 20, 1970, Ser. No. 30,186
Int. Cl. B23k *9/20*
U.S. Cl. 219—99 **1 Claim**

Apparatus and method for welding hollow studs (spuds) over a hole in a workpiece which includes the use of a hollow arc shield disposed within the hollow spud and having one end thereof projecting into the hole in the workpiece to provide alignment for the spud over the hole and to maintain the

hole free of molten metal during the welding operation. The spud preferably includes a chamfer in the weldable end thereof. The chuck for retaining the spud includes a second

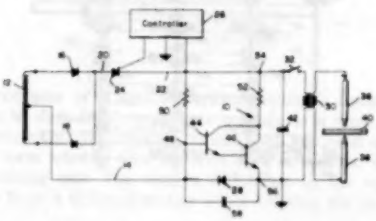


chuck therein for retaining one end of the internal arc shield and serves both as a retainer for the arc shield and as a stop member for the spud.

3,641,306
WELDING SUPPLY CIRCUIT INCLUDING CAPACITOR BLEED

Malcolm M. Oakes, Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Original application Jan. 8, 1969, Ser. No. 789,732, now Patent No. 3,586,882, dated June 22, 1971. Divided and this application Nov. 3, 1970, Ser. No. 86,448
Int. Cl. B23k *11/26*
U.S. Cl. 219—113 **9 Claims**



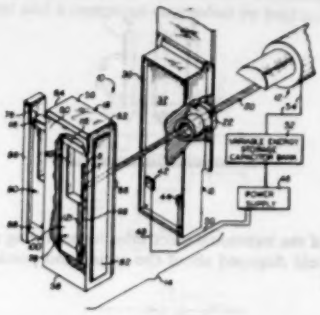
Detecting means detects current flow to a capacitor. When capacitor charging current stops, cessation of charging current is detected, and a quick dump bleed path is connected in parallel to the capacitor.

3,641,307
THERMOMETER TRIMMING METHOD AND APPARATUS

Joseph J. Duffy, Northport, and Stuart Donald Sims, Huntington, both of N.Y., assignors to Hadron, Inc., Westbury, N.Y.

Filed Nov. 26, 1968, Ser. No. 779,197
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 **17 Claims**

Apparatus for trimming a thermometer to remove excess mercury including a fixture mounted on a laser device in energy-receiving relationship therewith. The fixture includes a housing having an open end through which a thermometer-holding device is adapted to move between a thermometer-inserting position and a thermometer-aligned position wherein the thermometer is aligned with the laser beam. A light trap is provided for sealing the open end of the housing when the thermometer holding device is in the thermometer-



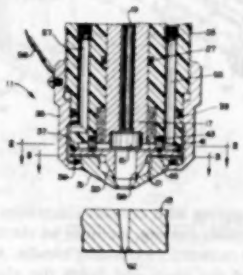
aligned position to prevent the leakage of energy from the laser device through the open end of the housing.

A method for trimming a thermometer also is disclosed.

3,641,308
PLASMA ARC TORCH HAVING LIQUID LAMINAR FLOW JET FOR ARC CONSTRICTION

Richard W. Couch, Jr., Hanover, N.H., and Robert C. Dean, Jr., Norwich, Vt., assignors to Chemetron Corporation, Chicago, Ill.

Continuation-in-part of application Ser. No. 814,288, Apr. 8, 1969, now abandoned. This application June 29, 1970, Ser. No. 50,674
Int. Cl. B23r *9/00*
U.S. Cl. 219—121 P **7 Claims**



In the plasma arc torch disclosed herein, the flow of plasma toward a workpiece is constricted and accelerated by a radially inward, laminar jet of liquid which forcefully impinges upon the plasma flow. As the liquid is relatively dense in relation to the gases comprising the plasma, the plasma flow is apparently mechanically pinched to reduce its cross section thereby concentrating the application of heat on the workpiece.

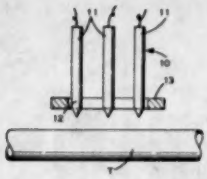
3,641,309
APPARATUS FOR WELDING THIN METAL SHEETS

Wolfram Kiebel, Isernhagen HB, Germany, assignor to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Aug. 19, 1970, Ser. No. 65,106
Claims priority, application Germany, Aug. 27, 1969, P 19 43 443.6
Int. Cl. B23k *9/08*
U.S. Cl. 219—123 **3 Claims**

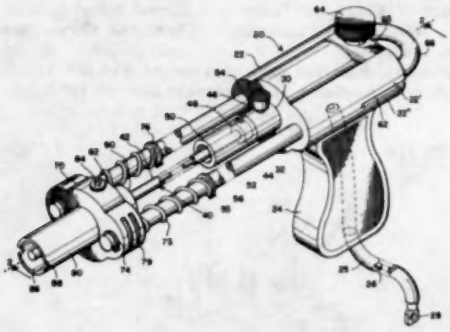
Apparatus for welding a longitudinal seam in thin metal sheets, including a plurality of welding electrodes arranged in a row and in alignment with the seaming portions of the

metal sheets, the electrodes being adapted to be singly and collectively adjusted in directions vertically and transversely related to the seam, together with means for stabilizing the



operation of the individual electrodes by providing an endless magnetic field disposed about the arcing end portions of the electrodes.

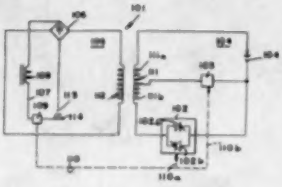
3,641,310
ELECTRODE HOLDER FOR ARC WELDING
Phillip M. Wilson, 133 Whitelaw Ave., Wood River, Ill.
Filed July 17, 1970, Ser. No. 55,790
Int. Cl. B23k *9/00*
U.S. Cl. 219—127 **9 Claims**



A device for welding with contact electrodes comprising a core having a metallic coating, includes an electrically insulative body with an outwardly extending handle. A metal chuck extends axially of the body and holds the electrode. A U-shaped frame has arms slidably inserted in the body and held by an adjustable clamp. A block slidable on the free ends of the arms is urged by springs toward the free ends of the arms. The block carries a removable cylindrical shroud for the electrode which extends through the shroud. An electric cable extends into the body and connects with the chuck. Interchangeable shrouds have differently shaped ends to conform with differently shaped surfaces of work to be welded.

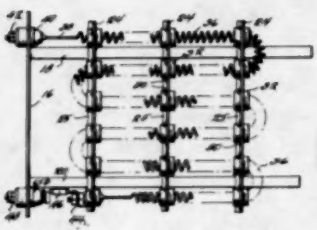
3,641,311
APPARATUS FOR THE IGNITION OF DIRECT CURRENT WELDING AND CUTTING ARCS
Peter Hildebrandt, Ismaning, and Walter Ruckdeschel, Munich, both of Germany, assignors to Linde Aktiengesellschaft, Hollriegelskreuth, Germany
Filed July 9, 1968, Ser. No. 743,347
Claims priority, application Germany, July 11, 1967, P 16 15 364.3
Int. Cl. B23k *9/10*
U.S. Cl. 219—135 **4 Claims**

A system for igniting direct current arcs for welding or cutting of metals, especially plasma welding, cutting and metal treatment and T.I.G. welding, wherein an elevated DC potential of 150 to 2,000 volts is temporarily superposed upon the welding potential of up to 100 volts during the ignition stage and is terminated upon detection of current flow between the electrode and the workpiece via an electronic switch adapted to cut out a primary winding or cut in a



secondary winding of a transformer interposed between the line current source and the rectifier. The system is used primarily for the closed chamber welding of metallic cases or shells of fuel elements for a nuclear reactor core under a blanket of helium.

3,641,312
OPEN COIL HEATING ELEMENT ASSEMBLY
George Edward Ammerman, and William McFarlane, both of Murfreesboro, Tenn., assignors to Heatcraft, Inc., Murfreesboro, Tenn.
Filed June 23, 1970, Ser. No. 49,095
Int. Cl. H05b *3/06*
U.S. Cl. 219—532 **2 Claims**

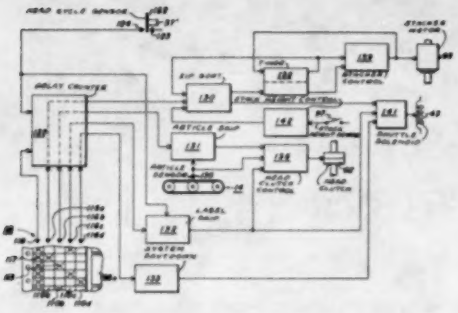


An arrangement for supporting open coil heater elements including a baseplate and a pair of spaced arms projecting from the plate. Each arm is rigidly affixed to the baseplate at one of its ends. A plurality of spaced cross supports are attached to the arms. The cross supports comprise plates having apertures therein to receive insulators through which the heater elements pass. The ends of the heater elements are appropriately connected to circuit terminals mounted to the baseplate.

3,641,313
COMBINATION CONTROLLER-LABEL FORM FOR ARTICLE-LABELING SYSTEMS
Donald W. Watson, Arlington Heights, Ill., assignor to Xerox Corporation, Rochester, N.Y.
Filed Nov. 10, 1969, Ser. No. 875,007
Int. Cl. G06r *19/00*
U.S. Cl. 235—61.6 R **2 Claims**

An article-labeling system including article supply means; an addressing machine with article-labeling head, said labels being in the form of an endless sheetlike piece having at least

one label row with a control tape portion-bearing control data for individual labels extending therealong; and means



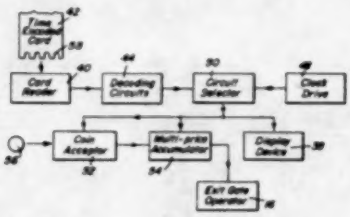
for operating and labeling system in accordance with the control data on the label form control tape.

3,641,314

TIME CODED, COIN CONTROL GATE SYSTEM

Aaron L. Abramson, 1611 Audubon St., New Orleans, La.

Filed Apr. 10, 1970, Ser. No. 27,347
Int. Cl. G06k *15/18*; **G08g** *1/14*
U.S. Cl. 235—61.8 A **10 Claims**



The exit gate of a vehicle parking facility is opened in response to deposit of the proper coinage in a multiprice, coin mechanism. The coinage value is set and read out in suitable form when a time encoded card is inserted into a card receiving unit. The card is withdrawn by the vehicle operator from a ticket dispenser when entering the parking facility.

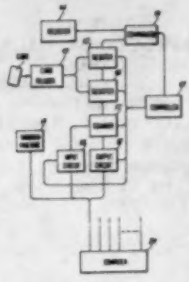
3,641,315

SYSTEM FOR AUTOMATICALLY CONDUCTING OFFICE WORK REQUIRED FOR TRANSACTIONS AT A BANK AND THE LIKE

Masanori Nagata, Kyoto, and Masato Mori, Osaka, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 27, 1970, Ser. No. 14,919
Claims priority, application Japan, Mar. 4, 1969, 44/17029
Int. Cl. H04q *5/02*; **G07f** *1/06*; **G06k** *15/18*
U.S. Cl. 235—61.7 B **2 Claims**

A system for automatically conducting office work required for transactions at a bank and the like establishments. In accordance with the system, the bank previously issues to each customer a card on which a predetermined information including a secret number is recorded, and at the same time gives to each said customer a memory number which has a predetermined relation to said secret number. The system comprises means for reading the information of a card presented by a customer for a transaction with the bank; means for storing a memory number presented by said customer; means for comparing said secret number and memory number to produce a control signal when said predetermined relation exists between said two numbers; means for providing a new information resulting from said transaction; and a computer controlled by said control signal



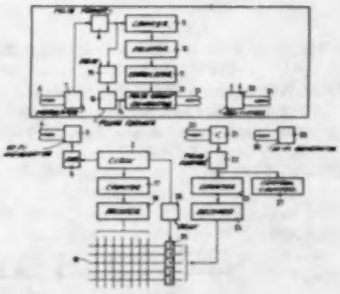
to store said information read from said card and at the same time select from the contents already stored therein an information required for said transaction with said customer, said last-named information to be exchanged for said new information.

3,641,316

IDENTIFICATION SYSTEM

Jurgen Dethloff, Elbchaussee 239, Hamburg, and Helmut Grottrup, Faustleste 5, Munich, both of Germany

Continuation-in-part of application Ser. No. 857,957, Sept. 15, 1969. This application Aug. 17, 1970, Ser. No. 64,548; Oct. 7, 1969, A 9413/69; June 30, 1969, 6199/69
Int. Cl. G06k *7/01*
U.S. Cl. 235—61.7 B **35 Claims**



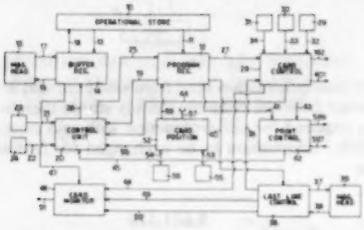
An identification system comprises a number of freely transportable identificands carrying data to be identified arranged at plural correlation positions, and an identifier cooperable with the identificands, when inserted into the identifier, to check the identity of a user of an identificand. A transmitter in the identifier transmits, to the identificand, a number of data, corresponding to the number of correlation positions of the identificand, in succession from the correlation positions. An interpretor is included in the identificand and has input and output terminals, and a selector device in the identificand supplies the transmitted data to the input terminals of the interpreter. A transmitter in the identificand is modulated from the output terminals of the interpreter and transmits the resultant modulated signals to the identifier for processing and evaluation. The identificands may be in the form of flat cards carrying one or more rotatable wheels having numbers around their periphery. The numbers are normally concealed, but the user may, when ready to use the identificand, set one or more wheels to the desired number. When the identificand is inserted into the identifier, the

identifier rotates the wheel or wheels back to the zero position to provide a number of pulses corresponding to the preset number on the wheel or wheels. Each card contains integrated circuits providing safety against falsification, and the identifier has means to detect any tampering with the integrated circuits.

3,641,317
MACHINE FOR PROCESSING MAGNETIC LEDGER CARDS

Alessandro Cortona; Pietro Musso, both of Turin; Fabrizio Saltini, Modena, and Giorgio Fiorenza, Milan, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Turin, Italy

Filed Sept. 9, 1969, Ser. No. 856,392
Claims priority, application Italy, Sept. 14, 1968, 53150 A/68
Int. Cl. G06r *17/00*
U.S. Cl. 235—61.11 D 12 Claims

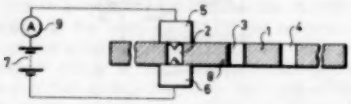


Machine for processing magnetic ledger cards comprising a hopper for receiving a ledger card with the magnetic strip parallel to the direction of the movement of insertion and a processing station formed by a substantially cylindrical path having means for circulating the card along said path, a magnetic head for reading and recording information on said magnetic strip and selectively operable means for ejecting the card from said cylindrical path.

3,641,318
RECORD MEDIUM AND A METHOD FOR STORAGE OF INFORMATION

Gunnar Tollet, Akerbyvagen 264, Taby, Sweden

Filed Apr. 23, 1969, Ser. No. 818,760
Claims priority, application Sweden, Apr. 29, 1968, 5808
Int. Cl. G06k *1/12*
U.S. Cl. 235—61.12 C 3 Claims



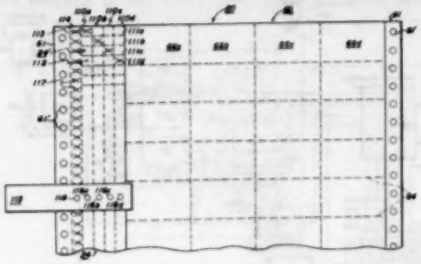
A storage medium consisting of a dielectric with preformed holes. Electrode pairs are inserted into selected ones of the holes and an electric discharge renders the walls of these holes conductive, either by deposition of carbon from the dielectric or by metal deposition from the electrodes. Sensing of information is by similar electrodes having a voltage not large enough to cause discharge.

3,641,319
COMBINATION CONTROLLER-LABEL FORM FOR ARTICLE LABELING SYSTEMS

John V. McGuire, Deerfield, Ill., assignor to Xerox Corporation, Rochester, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,002
Int. Cl. G06r *19/00*
U.S. Cl. 235—61.12 R 2 Claims

An article labeling system including article supply means; an addressing machine with article labeling head, said labels being in the form of an endless sheetlike piece having at least one label row with a control tape portion bearing control data for individual labels extending therealong; and means

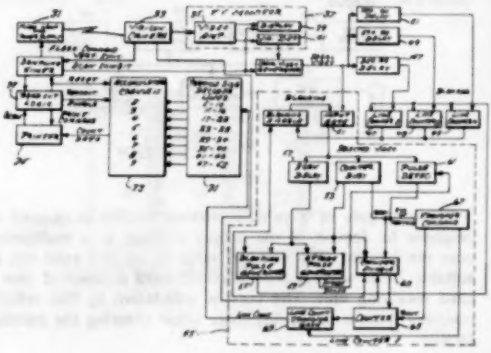


for operating the labeling system in accordance with the control data on the label form control tape.

3,641,320
RAINDROP COUNTER

John D. Stockham, Highland, Ind.; Lawrence B. Townsend, Downers Grove; Ronald L. Ohlhaber, Evanston, and Thomas M. Scopelite, Flossmoor, all of Ill., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 23, 1970, Ser. No. 100,977
Int. Cl. G06m *11/04*
U.S. Cl. 235—92 PC 3 Claims



A flashing light freezes raindrops with respect to time, the shadows are focused on a vidicon which detects the shadows and converts them to ideal video pulses. The number of scan lines intersecting the drops is determined by a series of line counters and the count is decoded into channels and printed.

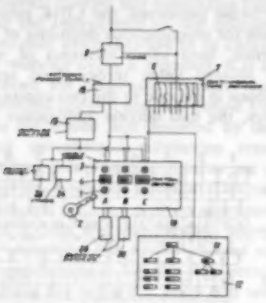
3,641,321
CHECKING DEVICE FOR CHECKING THE PRESENCE OF PERSONNEL

Friedrich Tonne, Uhlandstrasse 4, 7301 Scharnhausen, Germany

Filed Oct. 24, 1969, Ser. No. 869,275
Claims priority, application Germany, Nov. 16, 1968, P 18 09 306.6
Int. Cl. G06f *7/46*
U.S. Cl. 235—92 T 22 Claims

A control device for checking the time during which several persons belonging to an office or factory are present, which comprises a plurality of switches respectively allotted to the persons whose presence is to be checked and also

comprises a plurality of counting means respectively associated with said switches while the circuit means comprising said switches and said counting means comprise for each



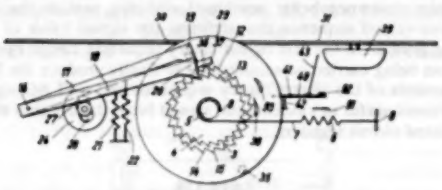
switch a blocking device adapted in response to the failure of the person whose presence is to be checked to switch off the switch during a work break to block the pertaining counting means from resetting.

3,641,322

PRESETTABLE COUNTER FOR COPYING APPARATUS

Jurgen Limberger, Hamburg-Poppenbuttel, Germany, assignor to Firma Lumoprint Zindler KG, Hamburg, Germany

Filed Mar. 27, 1970, Ser. No. 23,287
Claims priority, application Germany, Apr. 3, 1969, P 19 17 187.0
Int. Cl. G04b *17/12*
U.S. Cl. 235—132 R **17 Claims**



A presettable counting device such as is usable in a copying apparatus includes a rotating element set to rotate through a certain angle for each cyclic operation of the device. A presettable counting wheel is spaced from the rotating elements and their axis are disposed in parallel relationship. Number panels in a numbered sequence are provided on the circumferential periphery of the counting wheel commencing from a zero position. A spring drive member biases the counting wheel toward the zero position. A toothed locking wheel is connected to the counting wheel and locking levers extend between the toothed locking wheel and a multiple cam on the rotating element for holding the counting wheel and effecting its stepwise return to the zero position. A signalling device can be incorporated into the counting device to indicate when the counting wheel has returned to the zero position.

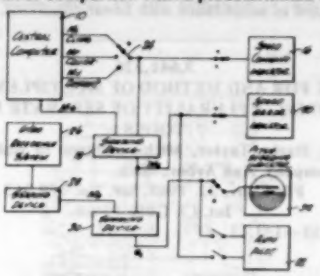
3,641,323

SPEED ALTITUDE COMMAND SYSTEM FOR AERIAL VEHICLES

Roland O. Hughes, Inglewood, and Joseph H. Allen, San Pedro, both of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Filed Dec. 31, 1969, Ser. No. 889,448
Int. Cl. G06g *7/70, 7/78*
U.S. Cl. 235—150.2 **11 Claims**

An electronic system which senses a plurality of variables during flight of an aerial vehicle and computes therefrom control parameters, presenting the computed parameters from continuous comparison with a predetermined maximum



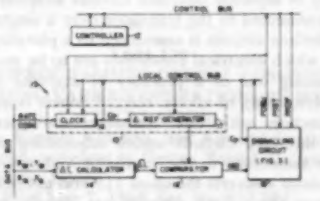
efficiency profile, displaying the error to the pilot or transmitting the error to an aircraft autopilot.

3,641,324

POSITION BUSY SIGNALING APPARATUS

John R. Longland; Roy M. Williams, Jr., both of Nashua, N.H., and Howard D. Sutton, Millington, N.J., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Apr. 21, 1969, Ser. No. 817,828
Int. Cl. G06f *15/20*
U.S. Cl. 235—151 **6 Claims**



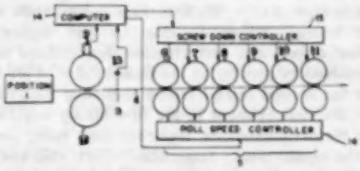
The Position Busy Signaling Apparatus is an open loop position busy generator for signaling the duration or completion of a position move for an imaging device in a display system. A display surface is divided into a grid of equal distance units along X and Y axial directions. The position distance ΔL is calculated for the larger of the X and Y axial distance to be travelled. A clock source increments a counter at a rate corresponding to the travel rate of the imaging device so as to provide incremental reference distances as the imaging device traverses the position distance. A comparator compares the position distance with successive incremental reference distances. When a less than or equal comparison is obtained, a signaling circuit signals that the position move has been completed.

3,641,325

METHOD OF COMPUTER CONTROL OF ROLLING MILLS

Tohru Arimura; Masamoto Kamata; Masaru Okado, and Takarokuro Ichimaru, all of Kawasaki, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1970, Ser. No. 12,775
Claims priority, application Japan, Feb. 21, 1969, 44/12571
Int. Cl. G05d *5/02;* **B21b** *37/12*
U.S. Cl. 235—151.1 **8 Claims**



In a method of computer control of a rolling mill, various operating parameters thereof are divided into a number of

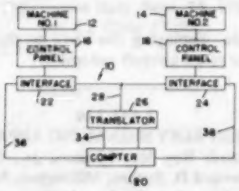
groups, the mean value of each group is determined and deviations of the parameters from the respective mean value are corrected in accordance with linear equations.

3,641,326

CIRCUIT FOR AND METHOD OF MULTIPLEXING FOR MONITORING A PLURALITY OF SEPARATE MACHINE TOOLS

Robert B. Harte, Taylor, Mich., assignor to Buhr Machine Tool Company, Ann Arbor, Mich.

Filed Nov. 22, 1968, Ser. No. 778,263
Int. Cl. G08c *15/00*
U.S. Cl. 235—151.11 **10 Claims**



The multiplexing circuit disclosed includes a translator and a plurality of separate interface circuits adapted to be alternatively connected to the translator over a single buss. Each of the interface circuits is connected to a plurality of specific points at which electrical conditions are to be monitored in a corresponding one of a plurality of machine tool control panels. Monitoring of all the control panels is accomplished in conjunction with one translator multiplexed to the separate interface circuits under sequencing control of a computer connected to the translator and interface panels. The translator converts the usual 115-volt alternating current signals from the control circuits into signals usable by the computer.

In operation the computer at a desired speed and in a desired sequence will provide control signals to the separate interface circuits to connect the control panels of individual machine tools to the translator for translation of monitored signals to the computer. Thus each of a plurality of separate machine tools is monitored with a single computer without the necessity of separate conversion circuits at each control panel. Only the standard 115-volt 60-cycle alternating current electric energy of the control panels pass between the interface panels and the translator.

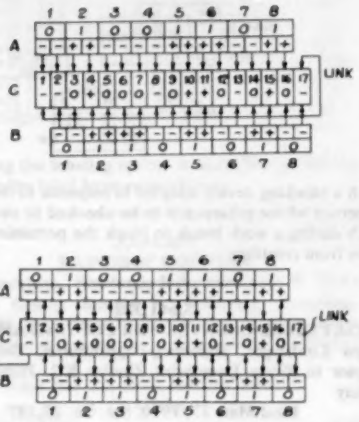
3,641,327

UNAMBIGUOUS DIGITAL PROCESSING OF DUAL BINARY THREE-VALUED CODES

Carl W. Nelson, Jr., 2606 N. Brandywine St., Arlington, Va.

Filed Aug. 13, 1969, Ser. No. 849,820
Int. Cl. G06f *5/02*
U.S. Cl. 235—155 **4 Claims**

This invention contemplates means for digital resolution of three-valued code ambiguities resulting from the combination in parallel of two signed binary sequences (O=−, 1=+, or vice versa) offset from one another by one-half code element, their combination relating elements of the second to adjacent elements of the first and resulting in three-valued code elements+, 0 or −, the first three-valued code sequence element being ambiguous due to the signed binary sequences' offset, said first element three-valued ambiguity being resolved by combining the signed value of the final element in the second signed binary sequence with the signed value of the first element in the first binary sequence; and, the last three-valued code sequence also being ambiguous due to the signed binary sequences' offset, said last element three-valued ambiguity being resolved by repeating the signed value of the final element in the second signed binary sequence as an appended final signed value in the resulting three-valued sequence, said appended final three-valued sequence element being called the LINK; the inherent non-redundant error detection feature of this class of three-valued codes being preserved; the LINK providing information and means for unambiguous decoding of the said three-valued sequence, zero value elements of which are ambiguous and all-zero value three-valued sequences being totally ambiguous in decode to the two component signed binary sequences, the said decode ambiguities being resolved



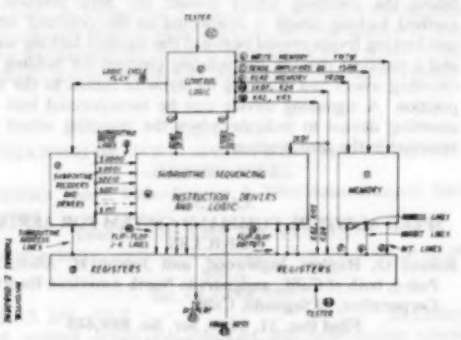
by circuit means to place the signed value of the three-valued LINK element into the last element of the second signed binary sequence, in turn the last element of the second signed binary sequence being combined with the next to the last three-valued sequence thus defining the signed value of the last element in the first signed binary sequence, circuit operations being carried on sequentially to finally produce the first elements of the signed binary sequences and a FLAG signal element useful in clocking the signed bnary binary into their related circuit registers.

3,641,328

KEYBOARD ENTRY MEANS AND POWER CONTROL MEANS FOR CALCULATOR

Thomas E. Osborne, San Francisco, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Original application June 23, 1966, Ser. No. 559,887, now Patent No. 3,566,160, dated Feb. 23, 1971. Divided and this application May 21, 1969, Ser. No. 826,528
Int. Cl. G06f *15/02*
U.S. Cl. 235—156 **21 Claims**



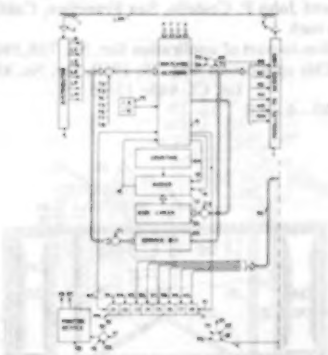
Internal control and subroutine logic transfers data between a keyboard input, a random access memory, and a

plurality of flip-flop registers to perform arithmetic operations and transfers the results of these operations to a cathode-ray tube output display. Power switching is employed in the internal control and subroutine logic so that the subroutines and the instructions of the calculator are supplied with power only when they are to be executed. When a random access memory cycle is required, it is automatically interposed between the otherwise regularly recurring logic cycles by the internal control and subroutine logic. Encoded transfer vectors are stored and decoded by the subroutine logic to permit unrestricted subroutine returns. In the keyboard input two power supply returns are employed to define one bit of the keyboard encoder. The random access memory is partitioned into one portion addressed by a single bit in an address register and into another, larger portion addressed by the remaining bits in the address register. Each flip-flop of the machine is a J–K flip-flop provided with an adjustable threshold for noise immunity and with a high internal gain on the J–K inputs. In the cathode-ray tube output display, a recurring pattern generated by integration in only two directions is selectively blanked to display the results of the operations performed by the calculator. A tester may be connected to the machine for allowing all subroutines to be operated in a single step mode. The tester is provided with switches for initializing any internal state of the machine or stopping normal execution under any prescribed conditions and with apparatus for accessing the random access memory.

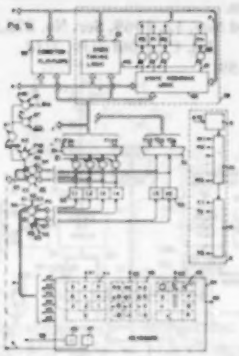
3,641,329
IMPROVEMENTS IN ELECTRONIC COMPUTER KEYBOARD CONTROL

Giovanni De Sandre, and Gastone Garziera, both of Milano, Italy, assignors to Ing. C. Olivetti & C. S. p. A., Ivrea (Torino), Italy

Filed Oct. 24, 1969, Ser. No. 869,219
Claims priority, application Italy, Oct. 28, 1968, 53652 A/68
Int. Cl. G06f 7/48
U.S. Cl. 235—156 **10 Claims**



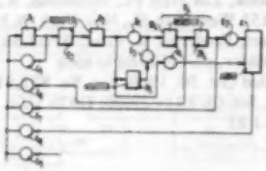
A control keyboard for an electronic digital machine (computer or calculator) has function keys and number keys. The number keys enter data into a first working register. The activation of any one particular function key of a group of such keys causes an answer corresponding to the ordered function to be placed in the first working register and the contents of the first working register to be transferred to a second working register. A plurality of totalizing registers are operatively connected to the first working register and, in response to the activation of any one of a second group of particular function keys, the number in the first working register is accumulated in one of the totalizing registers associated therewith. A further group of keys is provided which provide a combination of the functions of the first and second keys, and specific functions such a data printout and data exchange.



3,641,330
MICROPROGRAMMED DIGITAL COMPUTER PROVIDING VARIOUS OPERATIONS BY WORD CIRCULATION

Isao Hatano; Kenichi Kitajima, and Katsumi Iwatani, all of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyo-Ku, Kysto, Japan

Filed May 7, 1969, Ser. No. 822,394
Claims priority, application Japan, May 14, 1968, 43/32341
Int. Cl. G06f 7/48
U.S. Cl. 235—159 **9 Claims**



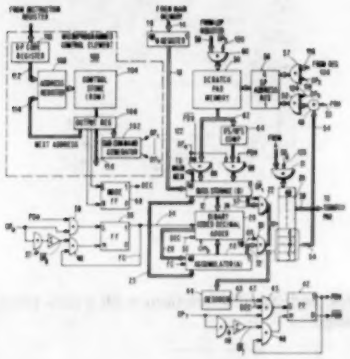
A plurality of shift registers are interconnected serially by a plurality of gates. To perform computer micro-operations, the words contained within the registers are circulated therethrough in steps, each step being divided into a plurality of separate time periods. The particular operation that is being performed is controlled by microprogrammed matrices which provide appropriate control signals during each time period to determine which gates are to be opened therein. Specific configurations are described for the operations of word addition, word transfer between registers, word transfer back to a register, shifting out of a register the greatest or the least significant digit of a word, and so forth. In addition, a configuration is shown including a single register and a decoding matrix for serially transferring the word in one register to a numeric display device, as is a configuration allowing retention of other words in the remaining registers during such a transfer. Finally, various embodiments of the microprogrammed matrices are shown.

3,641,331

APPARATUS FOR PERFORMING ARITHMETIC OPERATIONS ON NUMBERS USING A MULTIPLE GENERATING AND STORAGE TECHNIQUE

Leonard L. Kreidermacher, Acton, and David M. Hudson, Holliston, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 12, 1969, Ser. No. 875,909
Int. Cl. G06f *7/39, 7/38*
U.S. Cl. 235—159 13 Claims



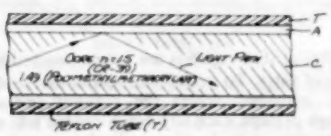
Apparatus for performing arithmetical operations with operands in binary coded decimal form includes means for initially generating and storing at least the first half of the multiples of an operand and during the arithmetic operation, generating a result by performing a selectable operation of either directly transferring or complementing selected prestored multiples.

3,641,332

FIBER OPTICS ILLUMINATION SYSTEM

Franklin G. Reick, 228 West Pl., Westwood, N.J., and Joseph R. Wilder, 151 West 86th St., New York, N.Y., assignors to Michael Ebert; Frederick R. Picut; Franklin G. Reick and Joseph R. Wilder, part interest to each

Filed Oct. 30, 1969, Ser. No. 872,519
Int. Cl. F21v *29/00*; G02b *5/14*
U.S. Cl. 240—1 EI 13 Claims



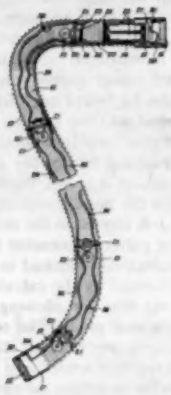
A fiber optics illumination system provided with a light source whose output is distributed among a plurality of flexible light pipes, the light transmitted by the pipes being applied to light tips or other instruments. The source includes a tungsten-halogen lamp submerged in water to effect filtration of infrared radiation, whereby cold light is supplied to the pipes, each pipe being constituted by a core of resinous material of large diameter contained within a cladding tube and separated therefrom by an air or other film having a relatively low-refractive index compared to that of the core.

3,641,333

ILLUMINATED BELT

Everett W. Gendron, 104 Andover Ct., Lemont, Ill.

Filed Dec. 5, 1968, Ser. No. 781,381
Int. Cl. F21v *21/00*
U.S. Cl. 240—6.4 W 8 Claims



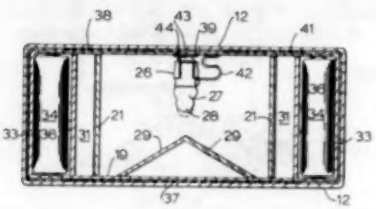
A flexible tubular belt of a generally translucent material adapted to carry an electromotive force power pack for connection to a plurality of light bulbs within the belt and the belt having a magnetic coupling which performs the dual function of holding the ends of the belt together and completing the electrical circuit to cause illumination of the bulbs within the belt.

3,641,334

ILLUMINATED MIRROR FOR COSMETIC CASE

Vernon L. Kipping, San Francisco, Calif., assignor to Roger J. Johson and John P. Costello, San Francisco, Calif., part interest to each

Continuation-in-part of application Ser. No. 718,390, Apr. 3, 1968. This application Aug. 29, 1969, Ser. No. 854,249
Int. Cl. A45c *15/06*
U.S. Cl. 240—6.45 R 5 Claims



A mirror, preferably handheld, has a light bulb disposed behind the mirror and a source of current within a casing. The bulb is located relative to a light reflective surface to direct light onto a beam dividing reflector, so that the light is reflected around the side edges of the mirror to shine onto the face of the user thereby providing sufficient illumination to permit use independent of other light. The light produced has a field sufficient in size to illuminate the entire face of the user and is characterized by softness. The system employs reflective optics to converge and distribute light uniformly over the illuminated object.

3,641,335
DECORATIVE STRUCTURE FOR FLARED FIBERS

Lamar J. Wall, Seal Beach, Calif., assignor to Poly-Optics, Inc.

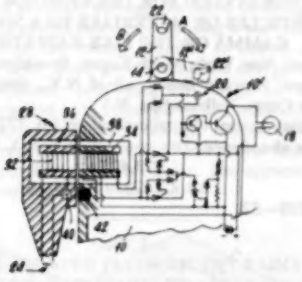
Filed Sept. 2, 1969, Ser. No. 854,632
Int. Cl. A47g 33/16; F21p 1/02
U.S. Cl. 240—10 P 1 Claim

A decorative structure in which tiers of flared optical fibers or the like extend vertically from a base therefor, and a backstop is secured adjacent the flared portions of the fibers.

3,641,336
ELECTRIC LAMPS FOR EMERGENCY AND/OR FOR DUTY UNDER PARTICULAR ENVIRONMENT CONDITIONS, AND RELATIVE IMPROVED LAMPS

Giovanni Boin, Via Luosi 9, Milan, Italy

Continuation of application Ser. No. 725,872, May 1, 1968, now abandoned. This application Apr. 5, 1971, Ser. No. 130,826
Int. Cl. F21l 7/00, 9/00, 11/00
U.S. Cl. 240—10.6 R 4 Claims

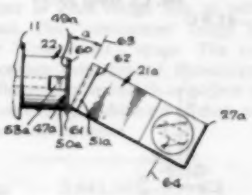


An electric emergency lamp includes a self-contained power supply, comprising a rechargeable accumulator or battery, a first electric circuit connectable to an external power supply for battery recharge and a second electric circuit controllable from the outside to switch on the light source of the lamp. The lamp is designed to operate in environments and/or conditions requiring the observance of tight seals, the lack of connections capable of giving rise to sparking and the like, for which purpose the electric battery circuits are incorporated within a waterproof lamp casing and can be connected to an external AC supply by an electric magnetoinductively operating power transducer, the secondary winding of which is incorporated within the waterproof casing, whereas the primary winding can be brought close to the waterproof casing, so as to ensure the closure of the magnetic circuit between said primary and secondary windings.

3,641,337
MAGNETIC FLASHGUN MOUNT

Gerhard I. W. Bahnsen, Box 1297, South Lake Tahoe, Calif.

Filed Apr. 2, 1970, Ser. No. 25,008
Int. Cl. F21l 15/16
U.S. Cl. 240—52.15 11 Claims

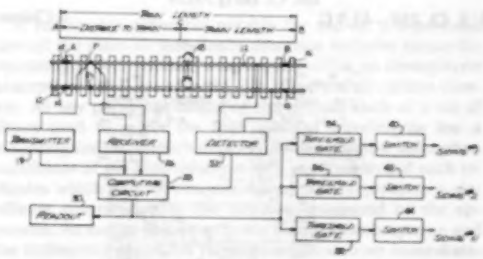


A mount for holding a photographic flashgun in a predetermined position relative to a camera, and including two structures to be carried by the flashgun and a support element respectively, with one of the structures taking the form of a magnet and the other being an element attracted to the magnet to hold the flashgun in place, and with the two structures being shaped to interfit in a relation positively holding the flashgun in a certain orientation in which its light is aimed directly toward a subject to be photographed.

3,641,338
TRAIN LENGTH MEASUREMENT SYSTEM

Richard V. Peel, Diamond Bar, and Billie W. Phillips, Upland, both of Calif., assignors to Marquardt Industrial Products Co., Cucamonga, Calif.

Filed Feb. 26, 1970, Ser. No. 14,391
Int. Cl. B61l 1/02
U.S. Cl. 246—1 R 16 Claims



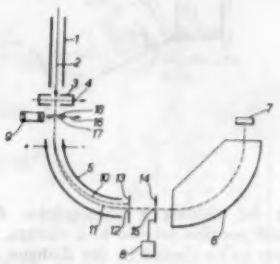
A system for measuring the length of a train is disclosed and includes a transmitter for applying a current to an isolated area of a pair of railroad tracks. The area of the track is generally longer than the longest expected train. A fixed voltage is provided to the computer which is indicative of the distance from one end of the measurement area to the other. A detector is positioned at the furthest end of the track measurement area. As a train appears within the two points, the wheels from the train short out the tracks causing the received voltage therein to change. When the train is detected by the detector, a voltage reading is taken which is then indicative of the distance from the transmitter to the rear of the train. This distance voltage is then combined (subtracted) with the overall fixed voltage to supply a voltage which is indicative of the length of the train.

3,641,339

GAS CHROMATOGRAPHY—MASS SPECTROMETRY

Andrew McCormick, Basingstoke, Hampshire, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed June 23, 1969, Ser. No. 835,706
Claims priority, application Great Britain, July 5, 1968, 32,335/68
Int. Cl. H01j 39/34
U.S. Cl. 250—41.9 G 7 Claims



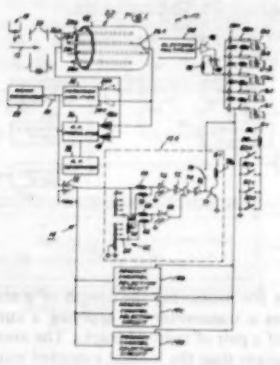
A small magnetic field is applied to the ion beam from the mass spectrometer ion source to deflect a substantial proportion of the relatively light carrier gas (e.g., helium) ions in the beam from impinging on the beam monitor electrode of the mass spectrometer, while leaving the relatively heavy sample (e.g., hydrocarbon) ions substantially undeflected. This increases the detection sensitivity and alleviates the need for ion source retuning between recording and standby conditions.

3,641,340

MULTICHANNEL READOUT MASS SPECTROMETER

Willem J. Van Der Grinten, Scotia, and George Jernakoff, Loudonville, both of N.Y., assignors to General Electric Company

Filed Sept. 22, 1969, Ser. No. 859,866
Int. Cl. H01j 39/34
U.S. Cl. 250—41.9 G 4 Claims



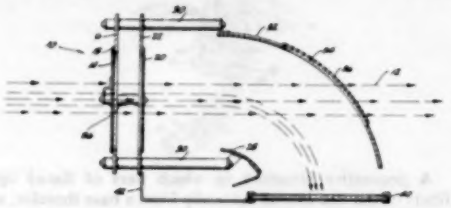
A multichannel readout mass spectrometer is described wherein the amplitude of the control voltage governing the passage of an ionized stream of a gas mixture through a quadrupole mass filter is employed to supervise the selection of readout channels individually recording various constituents of the ionized stream. For each readout channel, the control voltage is compared with a first preselected voltage to activate logic circuitry initiating recordation of a constituent of selected mass upon the readout channel and readout of the constituent is continued until a signal is generated from a second control voltage comparator circuit. Switching circuitry also is provided for recording the mass spectra of all constituents on a common channel simultaneously with a signal indicative of the recording interval for any one of the individual readout channels. The recording interval then is correlated with a single constituent forming the mass spectra whereupon readout of only the single constituent can be switched to the individual readout channel.

3,641,341

ION BEAM IMAGE CONVERTER

Douglas M. Jamba, Woodland Hills, and Robert M. Ennis, Jr., Malibu, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 23, 1969, Ser. No. 887,690
Int. Cl. H01j 37/26; G01n 23/00
U.S. Cl. 250—49.5 E 3 Claims



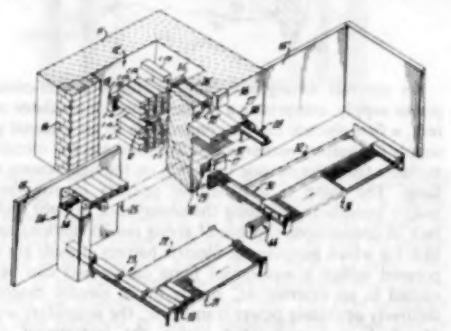
The ion beam image converter comprises a secondary emission screen in the ion beam path so that, when ions impinge upon the secondary emission screen, secondary electrons are emitted. An accelerator screen is positioned downstream from the secondary emission screen to accelerate the secondary electrons. Deflecting means is positioned downstream of the accelerator screen to deflect the electron beam onto a path away from the ion beam path. A phosphor image screen is placed on the deflected secondary electron path to convert the electron beam to visible image. Electron beam deflection can be either electrostatic or magnetic.

3,641,342

CONVEYOR SYSTEM FOR THE UNIFORM EXPOSURE OF ARTICLES OR MATERIALS TO A SOURCE OF GAMMA OR THE LIKE RADIATION

Jack Armel, New York; Mark Kogan, Brooklyn, and Howard S. Cohen, Howard Beach, all of N.Y., assignors to TSO Nuclear Corp., Ballston Spa, N.Y.

Continuation-in-part of application Ser. No. 772,111, Oct. 31, 1968, now abandoned. This application Nov. 3, 1969, Ser. No. 873,477
Int. Cl. G01n 21/00
U.S. Cl. 250—52 34 Claims



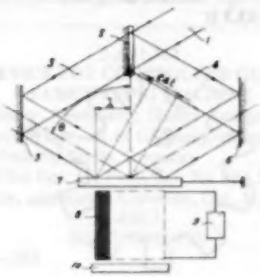
In conjunction with a known or fixed source of radiation, such as gamma radiation, the invention contemplates an au-

tomatic conveyor system for plurallike unitary containers laden with articles or materials to be subjected to desired exposure dosage of the radiation. The system accommodates a number of containers at all times, and uniform exposure is achieved for the contents of each container by having all containers follow precisely the same pattern or locus of movement through the system, and with respect to the source. Container movement is accomplished by indexing operations, performed simultaneously on all containers; the desired exposure time is governed by selection of dwell time between indexes, so that a single indexing cycle may serve the system regardless of the selected exposure time.

3,641,343
METHOD AND APPARATUS FOR THE MEASUREMENT OF DURATION OF ULTRASHORT PULSES OF MONOCHROMATIC LIGHT

Philippe Langer, 91 bis, avenue de Clamart, 92 Issy-les-Moulineaux, France

Filed Sept. 8, 1970, Ser. No. 70,037
Claims priority, application France, Sept. 12, 1969, 6931107
Int. Cl. G01n *21/16, 23/00*
U.S. Cl. 250—71 R **10 Claims**

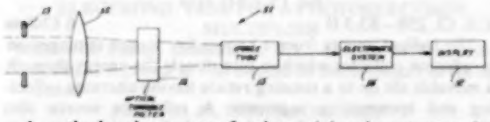


A method of and apparatus for the measurement of duration of ultrashort pulses of monochromatic polarized light, such as laser pulses. The method comprises splitting the polarized light beam into two identical beams, causing the two split beams to travel through the same optical path and to interfere on a photocathode comprising a thin metal layer disposed in vacuo, the energy required to detach the electrons from the layer being greater than the energy of the incident light photons, producing an image of the multiphotonic interaction zone obtained on the photocathode by means of electrons detached from the photocathode by a multiphotonic process in response to photons in coincidence from the two split light pulse therefrom. The apparatus is appropriate for carrying out the method.

3,641,344
SOLAR-STIMULATED FLUORESCENT RADIATION DETECTION METHOD AND APPARATUS

David A. Markle, Wilton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 1, 1969, Ser. No. 811,738
Int. Cl. G01n *21/34*
U.S. Cl. 250—71 **9 Claims**

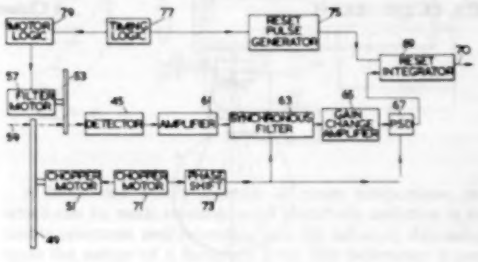


A method and apparatus for determining the presence, location and relative concentration of certain fluorescent materials in a scene that is illuminated by sunlight. The particular fluorescent materials are characterized in that they fluoresce at wavelengths coincident with one or more Fraunhofer absorption bands. Two images are formed from light collected from the scene. One of the images consists mainly of light from the scene having a spectral band-pass inside a Fraunhofer absorption band and the other image consists mainly of light from the scene having a spectral band-pass in the continuum near the same Fraunhofer absorption band. The two images are normalized so that intensities on corresponding portions of each image due to reflected solar radiation are equal. The "continuum" image is then subtracted from the "Fraunhofer" image. The resulting difference image consists primarily of fluorescent radiation derived from the fluorescent materials or objects in the scene and provides a direct visual indication of their presence, location and relative concentration.

3,641,345
INFRARED RADIOMETER APPARATUS FOR DETECTING CLEAR-AIR TURBULENCE FROM AN AIRCRAFT

Robert Coackley; Michael Leslie Reynolds, both of Camberley, and Clive Douglas Rodgers, Oxford, all of England, assignors to National Research Development Corporation, London, England

Filed Mar. 5, 1970, Ser. No. 16,922
Claims priority, application Great Britain, Mar. 6, 1969, 11,868/69
Int. Cl. G01j *5/06;* **B01k** *11/00*
U.S. Cl. 250—83.3 H **23 Claims**



A radiometer apparatus suitable for use on a supersonic aircraft for clear-air turbulence detection includes means for operating at four selected wavelengths within an atmospheric absorption band, for example the 15μ band of carbon dioxide. At any particular height of the aircraft each of a set of filters used to select the four selected wavelengths has a weighting function which depends on the effective absorption coefficient of the atmosphere at that wavelength and each indicates which part of the atmosphere ahead provides a significant contribution to the radiation measured by the apparatus. At longer wavelengths the atmosphere is opaque and the radiometer apparatus receives radiation from immediately in front of the aircraft. By generating suitable functions from the outputs of radiation passed by two or more of the filters it is possible to detect turbulence of the type looked for.

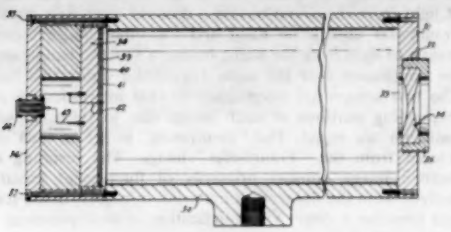
3,641,346
PYROELECTRIC JOULEMETER USING A DIVERGENT LENS

Jean L. Lachambre, Charlesbourg, Quebec, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence of Her Majesty's Canadian Government

Filed Mar. 20, 1970, Ser. No. 65,591
Claims priority, application Canada, Aug. 29, 1969, 060798
Int. Cl. G01j *1/42*
U.S. Cl. 250—83 R **3 Claims**

A pyroelectric pulse energy measuring device is disclosed in which a pyroelectric element is mounted adjacent a heat

sink and within a reflective container. A lens is provided at one end of the container so that incident radiation impinges



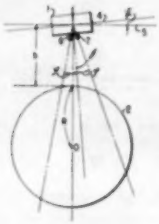
on substantially the entire surface of the pyroelectric element, the amount of incident radiation being measured by the pyroelectric voltage output.

3,641,347

APPARATUS FOR DETECTING THE ATTITUDE OF AN ARTIFICIAL SATELLITE

Moritada Kubo, Tokyo; Masamichi Shigehara, and Yasuo Nogiwa, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Horikawa-cho, Kawashaki-shi, Japan

Filed July 23, 1970, Ser. No. 57,448
Claims priority, application Japan, July 25, 1969, 44/58383
Int. Cl. G01j *1/20*
U.S. Cl. 250—83.3 H **4 Claims**



An artificial satellite includes a pair of sensors for detecting ultraviolet rays from the horizon of the earth. The pair of sensors are mounted on the satellite with a predetermined angle therebetween. When the angle of inclination of the spin axis of the satellite to the horizon thereof is relatively small both of the sensors will simultaneously detect rays from the horizon of the earth. The difference in the outputs of the two sensors will provide a measurement of the inclination angle of the spin axis and hence the attitude of the satellite. On the other hand, when the angle of inclination of the spin axis of the satellite to the horizon thereof is relatively large, one of the pair of sensors will be out of sight of the earth and the output of the other sensor will detect rays from the horizon of the earth to provide a measurement of the inclination angle of the spin axis of the satellite.

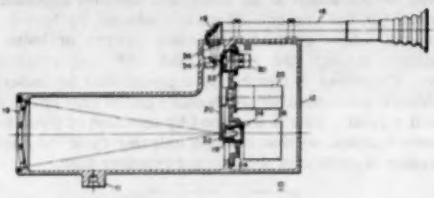
3,641,348

THERMAL IMAGING SYSTEM WITH THERMAL IMAGE SUPERIMPOSED ON A TARGET SCENE

Frank Schwarz, Stamford, Conn., assignor to Barnes Engineering Company, Stamford, Conn.

Filed July 24, 1969, Ser. No. 844,248
Int. Cl. G01j *1/02, 1/10*
U.S. Cl. 250—83.3 HP **5 Claims**

A field of view which is sighted through a telescope is simultaneously scanned by a rotating reticle and applied to an infrared detector to derive thermal information from the field of view. A light source is modulated by the infrared channel and the intensity-modulated light source is imaged through the same reticle and superimposed on the sight of the telescope. The operator will thus see in the telescope the



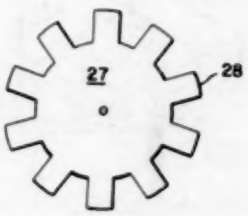
view of the target scene with a red tinge in those regions in which the target is warm or overheated.

3,641,349

METHOD FOR MEASURING THE AMOUNT OF SUBSTANCE ASSOCIATED WITH A BASE MATERIAL

Erick B. Dahlin, Saratoga, Calif., assignor to Measurex Corporation, Santa Clara, Calif.

Filed Sept. 29, 1969, Ser. No. 861,588
Int. Cl. G01j *3/42*
U.S. Cl. 250—83.3 H **2 Claims**



Apparatus and method of measuring the amount of water absorbed in paper being made by a papermaking machine in which the paper is scanned by a radiation source emitting 1.94 micron radiation which is strongly sensitive to the moisture in the paper and 1.8 micron radiation which is much less sensitive. This radiation is passed through the paper sheet and split into two beams by filters. The two wavelengths are detected by lead sulfide cells. A light chopper interrupts the total beam to cause the AC signal output of the cell to reflect the received intensity of the particular wavelength with the actual impedances of both cells being nullified. The ratio of the peak values of the AC signals from the cells is proportional to moisture content.

3,641,350

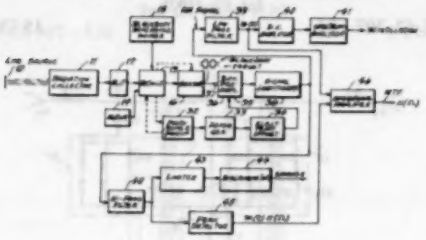
INFRARED ANALYZER FOR INDICATING THE SCINTILLATION SPECTRUM, SHIMMER AND MODULATION TRANSFER FUNCTION OF THE RADIATION PATH

Spyros K. Petropoulas, Brookeville; Robert E. Jehle, Wheaton, both of Md., and Mendel M. Halberstam, Brooklyn, N.Y., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 8, 1970, Ser. No. 70,061
Int. Cl. G01j *3/34*
U.S. Cl. 250—83.3 H **6 Claims**

The radiant energy from a known live source impinges on a radiation collector which in turn directs the energy through a movable slit on to a rotating reticle having alternate reflecting and transmitting segments. A reference source also directs energy on to the reticle and the reticle output is directed toward a sensor whose output is processed by a differential amplifier and a signal amplifier. A reference phase generator circuit controls the gain of the differential amplifi-

er. The output of the signal amplifier is further processed to provide only the low frequencies, which are then amplified and analyzed to provide a scintillation spectrum. A shimmer output is obtained by eliminating the low frequencies and applying the resultant to a limiter and a discriminator. The modulation transfer function is derived by combining, in an operational amplifier, the low-passed frequencies from the signal amplifiers and the peak detected high frequencies.



3,641,351

LASER DEVICE FOR CONTROLLED GUIDANCE OF FABRICATING MACHINE

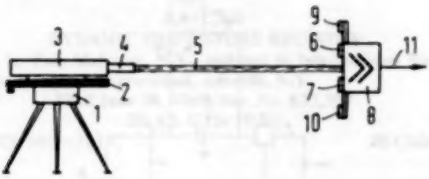
Otmar Hintringer, Neubiberg; Walter Koniger, Munich, and Jurgen Thorn, Haar, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Oct. 15, 1969, Ser. No. 866,568

Claims priority, application Germany, Oct. 31, 1968, P 18 06 450.1

Int. Cl. G01j *1/20*

U.S. Cl. 250—203 **8 Claims**



A receiver stably affixed to a fabricating machine comprises at least two spaced photosensitive units, positioned transversely to a reference plane formed by a flared modulated laser guide beam, one on each side of the reference plane. A difference amplifier is connected to the photosensitive units in a manner whereby deviation of the fabricating machine from the reference plane produces an output control signal of the difference amplifier for guiding the fabricating machine back into the reference plane.

3,641,352

ELECTRONIC LENS FOR A PHOTOELECTRON MULTIPLIER

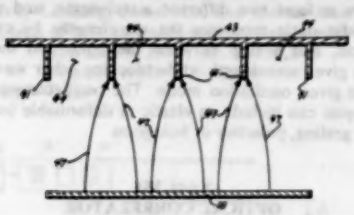
Mahlon B. Fisher, Skaneateles, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 16, 1969, Ser. No. 885,577

Int. Cl. H01j *39/12, 39/50*

U.S. Cl. 250—207 **2 Claims**

An improvement in a crossfield photoelectron multiplier that has a plurality of electron emitting dynodes parallel and longitudinally extended with respect to the anode. The improvement anode has a series of parallel fins forming channels and controlling the electron field between the anode and the dynodes and between the anode and the cathode.



3,641,353

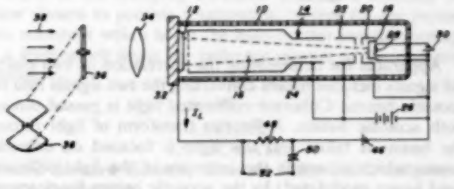
ELECTRON BEAM BOLOMETER

Francis X. McNally, Baltimore, and Louis Chiosi, Ellicott City, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 17, 1970, Ser. No. 64,444

Int. Cl. H01j *31/50*

U.S. Cl. 250—213 VT **6 Claims**



A bolometer which operates at room temperature and which can be made sensitive to all blackbody radiation in the visible spectrum and extending into the infrared, depending upon the nature of a faceplate used. The bolometer is constructed by sandwiching a suitable semiconductor in smoke form between gold black as one electrode and a flooding electron beam as the other, the sensing layer being mounted in a vacuum tube.

3,641,354

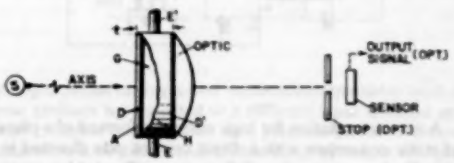
OPTICAL MODULATION BY FLUIDIC OPTICS UTILIZING CHROMATIC ABERRATION

Jack De Ment, 4847 Southeast Division St., Portland, Oreg.

Filed Mar. 8, 1967, Ser. No. 621,658

Int. Cl. H01j *3/14*

U.S. Cl. 250—216 **22 Claims**



Optical modulation in the ultraviolet, visible and/or infrared spectrum, for a range of uses including optical computers, data-processing and optical information processing systems together with the transduction of gas and liquid fluidic signals and pressure transients to optical and electrical signals, a fluidic optic such as a transmission or reflection elastic lens which includes a fluid-oscillable elastic wall, typically a fluid-filled chamber having at least one elastic wall

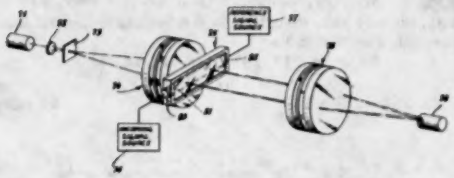
driven by alternating flow or pulse fluid oscillation means, optically coupled with a light source like a laser which generates at least two different wavelengths, and a sensor. The fluidic optic separates the wavelengths by chromatic aberration, and a stop between the optic and the sensor passes a given wavelength while blocking other wavelengths during a given oscillation mode. The oscillable wall of the fluidic optic can include an elastic or deformable image, diffraction grating, polarizer or hologram.

3,641,355

OPTICAL CORRELATOR

Kendall Preston, Jr., New Haven, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Original application Feb. 24, 1966, Ser. No. 529,846, now Patent No. 3,457,425. Divided and this application Feb. 13, 1969, Ser. No. 822,091
Int. Cl. G01d 5/34
U.S. Cl. 250—229 4 Claims



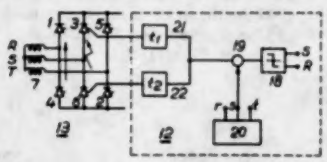
Apparatus for determining the correlation of two electrical signals includes means converting the two signals into two acoustic beams. Coherent collimated light is passed through both acoustic beams. A Fourier transform of light through the beams is taken and this light is focused on detection means which measures the intensity of the light diffracted (and hence modulated) by the acoustic beams for determining the correlation of the electrical signals. In one embodiment, the two acoustic beams are coaxial and the light is passed through both waves simultaneously.

3,641,356

STATIC CONVERTER STATION FOR HIGH VOLTAGE

Ake Ekstrom, Ludvika, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Feb. 16, 1971, Ser. No. 115,292
Claims priority, application Sweden, Feb. 19, 1970, 2089/70
Int. Cl. H02j ; H02m 1/02
U.S. Cl. 307—64 10 Claims



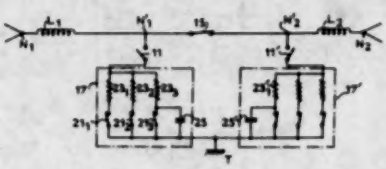
A converter station for high voltage is formed of a plurality of static converters with a direct current side directed in series. Each converter is a full-wave rectifier bridge provided with a control device. An additional control device is provided with a reserve control for one of the converters, which controls two series-connected rectifier groups of the bridge with different delay angles, one greater and the other less than 90°. As a result the two series rectifiers in one phase of the bridge conduct simultaneously and current is commutated at a certain frequency from the rectifier in one phase of the rectifier bridge to the rectifier in a subsequent phase of the bridge.

3,641,357

CIRCUIT-BREAKING TECHNIQUE AND DEVICE

Jean Louis Gratzmuller, 66 Boulevard Maurice Barres, 92 Neuilly sur Seine, France

Filed May 28, 1970, Ser. No. 41,351
Claims priority, application France, June 3, 1969, 69 18 170
Int. Cl. H02h
U.S. Cl. 307—94 15 Claims



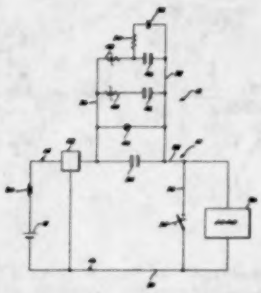
A method and apparatus for cutting off a branch between two junctions of a DC power transmission network in which there are first earthed by closing contactors two adjacent points of said branch, a circuit breaker located between said points is opened, other circuit breakers are successively opened, each such circuit breaker being mounted in series with a resistor, and a capacitor absorbs the final cutoff current.

3,641,358

CONSECUTIVE CROWBAR CIRCUIT BREAKER

Kenneth T. Lian, and Willis F. Long, both of Thousand Oaks, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed June 10, 1970, Ser. No. 45,147
Int. Cl. H01h 9/30
U.S. Cl. 307—136 12 Claims



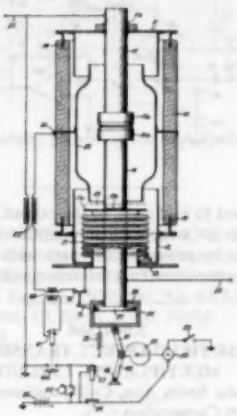
A circuit breaker is inserted in a high-current, high-voltage DC power line between the source and the load. The circuit breaker comprises a parallel connection of a transfer switch, an electronic switch, a first consecutive interrupter having a preferably nonlinear resistor in series therewith, and a second consecutive interrupter having a preferably nonlinear resistor in series therewith. Furthermore, a surge capacitor and its suppression resistance are serially connected in parallel around the second consecutive interrupter. When a fault occurs, the transfer switch is opened and is deionized during conduction of the electronic switch. Offswitching of the electronic switch causes current flow through the two parallel consecutive interrupters with their series resistances to decrease circuit current. During the period that the consecutive interrupters are sequentially opened, the electronic switch is conductive so that the consecutive interrupters can be deionized.

3,641,359

MONITOR CIRCUIT FOR VACUUM-TYPE ELECTRIC CIRCUIT INTERRUPTER

Orin P. McCarty, Pittsfield, Mass., assignor to General Electric Company

Filed Dec. 4, 1970, Ser. No. 95,107
Int. Cl. H01h 9/30
U.S. Cl. 307—136 8 Claims



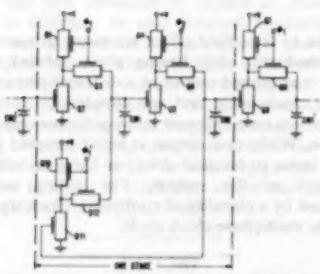
This application discloses a protective circuit for monitoring both loss of vacuum and contact wear in a vacuum-type electric circuit interrupter having separable contacts and a vapor shield surrounding the contacts. The shield is so located that a part fixed to the moving contact rod and normally spaced from the shield will closely approach or engage the shield as a result of contact wear. A monitor circuit including the rod-to-shield gap includes current responsive indication or control means.

3,641,360

DYNAMIC SHIFT/STORE REGISTER

Ying L. Yao, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1969, Ser. No. 837,597
Int. Cl. G11c 19/00
U.S. Cl. 307—221 C 20 Claims



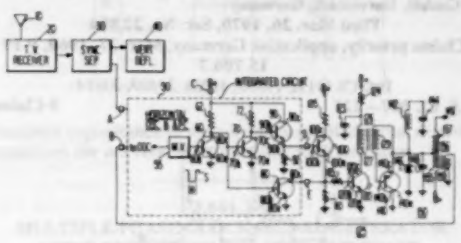
A dynamic shift register having storage capabilities. A regeneration circuit connected between the different sections of any stage (bit storage position) allows indefinite storage without shifting between stages. MOSFETS are used in a preferred embodiment and interelectrode capacitances are used to store data. Voltages on these capacitances are regenerated during store operation, rather than shifting the voltages in the direction of data shift.

3,641,361

PROTECTION CIRCUIT

Allen Leroy Limberg, Somerville, and Steven Alan Steckler, Clark, both of N.J., assignors to RCA Corporation

Filed Dec. 3, 1970, Ser. No. 94,841
Int. Cl. H02k 7/20; H03k 5/08
U.S. Cl. 307—202 11 Claims



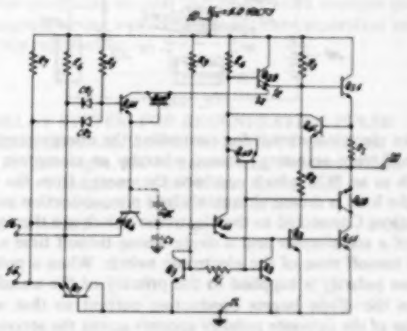
A protection circuit limits the collector current of a transistor employed as a clamp-to-ground stage in the event the collector terminal of the transistor is accidentally short circuited during conduction to a low-impedance voltage source. The protection circuit includes a transistor which has its base-emitter junction coupled across the base-emitter junction of the clamping transistor and has a collector resistor chosen to provide a saturation current for the protection transistor which holds the base-emitter junction voltage at a level which limits the collector current of the clamping transistor.

3,641,362

LOGIC GATE

Edward Bernard Gamble, Granada Hills, Calif., assignor to RCA Corporation

Filed Aug. 10, 1970, Ser. No. 62,399
Int. Cl. H03k 19/34, 19/36
U.S. Cl. 307—215 10 Claims



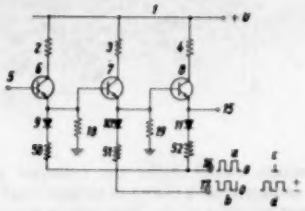
A logic circuit having a first multiemitter transistor each of whose emitters is connected to a different input terminal and whose collector is connected to a junction point. A second transistor, whose conduction is controlled by means of a plurality of diodes coupled between its base and a different one of the input terminals, has its emitter connected to the base of the first transistor. For one operating condition the emitter-to-base junctions of the first transistor as well as the diodes are reverse biased and the second transistor provides a high transient current followed by a lower steady state current, through the base-to-collector junction of the first transistor, into the junction point. For another operating condition at least one of the emitter-to-base junctions of the first transistor as well as at least one of the diodes are forward

biased and a transient current is provided to the base of the first transistor which then draws its collector current out of the junction point.

3,641,363
SHIFT REGISTER

Gerhard Krause, Munich, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Filed Mar. 26, 1970, Ser. No. 22,884
Claims priority, application Germany, Mar. 27, 1969, P 19 15 700.7
Int. Cl. G11c *19/00*; H03k *23/00, 23/14*
U.S. Cl. 307—221 9 Claims

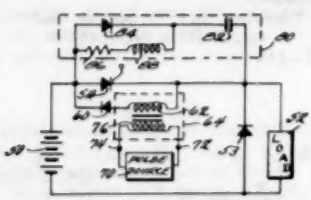


Shift registers using the charge-storage effect in individual semiconductors as data stores, including means for applying alternating signals to step the data forward.

3,641,364
SCR CHOPPER CIRCUIT

Wally E. Rippel, Ithaca, N.Y., assignor to Electric Fuel Propulsion, Incorporated, Ferndale, Mich.

Filed July 18, 1969, Ser. No. 843,032
Int. Cl. H03k *17/00*
U.S. Cl. 307—240 22 Claims



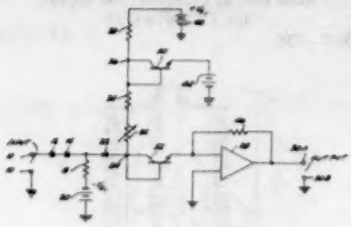
An electrical circuit for controlling the energy supplied to a load from an energy source whereby an electronic switch such as an SCR which conducts the energy from the source to the load is driven alternately into nonconduction and conduction. Connected to the electronic switch are the secondary of a transformer and a diode whose turnoff time exceeds the turnoff time of the electronic switch. When a pulse of a given polarity is supplied to the primary of the transformer, then the diode begins conducting current so that when a pulse of the opposite polarity appears across the secondary of the transformer, the diode conducts current in the reverse direction, thus reverse biasing the electronic switch. When the diode recovers, recovery of the electronic switch also takes place.

3,641,365
PRECISION FAST ANALOG SWITCH

Jon H. Grant, Diamond Bar, and Walter D. Bales, Garden Grove, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 15, 1970, Ser. No. 37,788
Int. Cl. H03k *17/00*
U.S. Cl. 307—241 9 Claims

A precision fast electronic switch is provided in an arrangement wherein, in the absence of a switching signal to the circuit, current flows from a source in one path through one diode to a sink. In the presence of a switching signal the one diode is blocked and the current flows through another

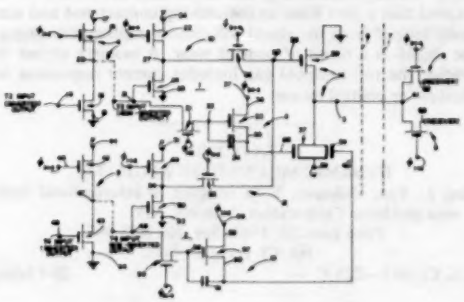


diode, connected to said path, to the output. The value of the current which is switched is maintained at a desired reference value by providing the path with a third clamping diode which is connected to a reference voltage.

3,641,366
MULTIPHASE FIELD EFFECT TRANSISTOR DRIVER MULTIPLEXING CIRCUIT

Ted Y. Fujimoto, Santa Ana, Calif., assignor to North American Rockwell Corporation

Filed Sept. 14, 1970, Ser. No. 71,702
Int. Cl. H03k *17/00*
U.S. Cl. 307—251 2 Claims



From one to four field effect transistor driver circuits on one semiconductor chip having phase related inputs are gated to a multiplexed output at a different phase times of a multiphase clock cycle and are sampled by corresponding receiver circuits on a different semiconductor chip during the same phase. While one output is being sampled during one phase, an input to another driver is being isolated prior to being gated to the output. The gating sequence is synchronized by a plurality of multiphase clock signals implementing the multiphase clock cycle.

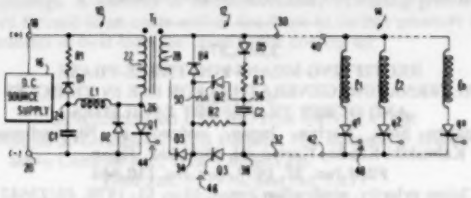
3,641,367
PULSE DRIVING CIRCUIT FOR INDUCTIVE LOAD

Brandt M. Griffing, Delray Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1970, Ser. No. 101,232
Int. Cl. H03k *17/00, 17/56*
U.S. Cl. 307—252 J 6 Claims

A circuit for providing constant width driving pulses to a plurality of selected print hammer coils from a single DC source. An RC circuit is used to commutate a controlled

rectifier in series with the hammer coils in order quickly to terminate the current through each coil after actuation of its



print hammer, thereby providing for high-speed operation of the hammers.

3,641,368

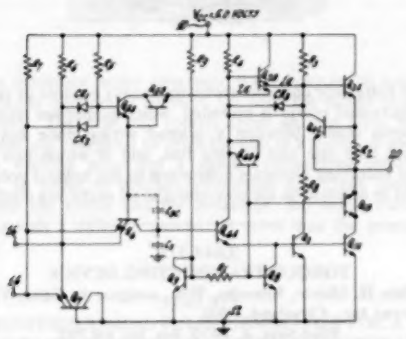
LOGIC CIRCUIT WHICH TURNS ON AND OFF RAPIDLY

Edward Bernard Gamble, and Ramon Hess Aires, both of Los Angeles, Calif., assignors to RCA Corporation

Filed Aug. 10, 1970, Ser. No. 62,515

Int. Cl. H03k *17/00, 19/08*

U.S. Cl. 307—254 **15 Claims**



A controllable shunt current path such as the conducting emitter-to-collector path of a first transistor, is connected in shunt with the emitter-to-base path of a conducting output transistor. In response to a turnoff signal for the output transistor, the first transistor is caused to conduct more heavily in a direction to stop forward conduction of the emitter-to-base diode of the output transistor and in this way to speed up its turnoff. Other features of the circuits illustrated include overload current protection and means for speeding up the discharge of any charge present at an output terminal upon switching of an output transistor from a nonconducting to a conducting condition. One of the circuits illustrated also includes means for ensuring proper sharing of current drive to a pair of transistors and means for ensuring "soft" saturation of the output transistor.

3,641,369

SEMICONDUCTOR SIGNAL GENERATING CIRCUITS

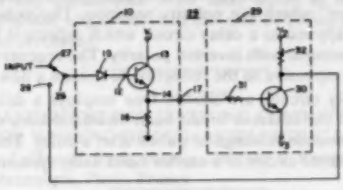
Clarence Robert Wallingford, Chicago, Ill., assignor to Hazeltine Research, Inc.

Original application Mar. 20, 1968, Ser. No. 714,663, now Patent No. 3,588,544. Divided and this application July 23, 1970, Ser. No. 57,738

Int. Cl. H03k *5/00*, **H03b** *5/12*

U.S. Cl. 307—260 **6 Claims**

Disclosed are semiconductor circuits which are capable of operating as oscillators or as combined oscillators and triggered pulse generators, and which make use of internal



transistor capacitance in such a manner that external discrete capacitors are not required to provide such operation.

3,641,370

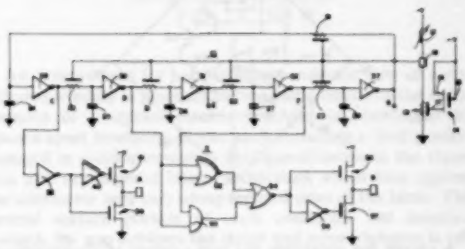
MULTIPLE-PHASE CLOCK SIGNAL GENERATOR USING FREQUENCY-RELATED AND PHASE-SEPARATED SIGNALS

Gary Lee Heimbigner, Anaheim, Calif., assignor to North American Rockwell Corporation

Filed June 15, 1970, Ser. No. 46,095

Int. Cl. H03k *17/28*

U.S. Cl. 307—269 **7 Claims**



An oscillator generates two signals having a fixed phase separation and a frequency relationship. The signals are combined for producing double- and single-width multiple-phase clock signals having a predetermined phase separation and a frequency relationship.

3,641,371

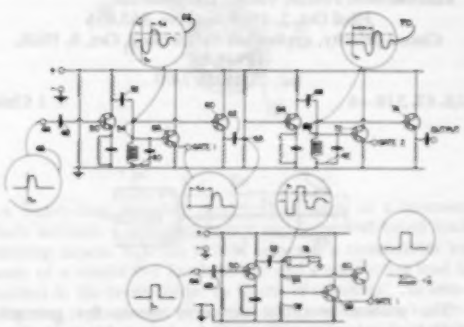
DELAY SYSTEM FOR REGENERATING PULSE PERIODICALLY DURING DELAY INTERVAL

Victor F. Cartwright, 130 N. Janet Place, Fullerton, Calif.

Filed June 12, 1970, Ser. No. 45,618

Int. Cl. H03k *17/26, 17/28*

U.S. Cl. 307—293 **4 Claims**



A time delay system capable of delaying very fast pulses for a relatively long time without appreciable distortion by

regenerating the pulse periodically during the delay interval. Each regenerated pulse is used to regenerate the next pulse. In preferred form, regeneration is accomplished in amplifiers or "switches" which are polarity sensitive. The pulse to be delayed is applied to a delay circuit which reflects it back to the input terminal with inverted polarity. The regenerating "switch" is responsive to the reflection to initiate a new pulse.

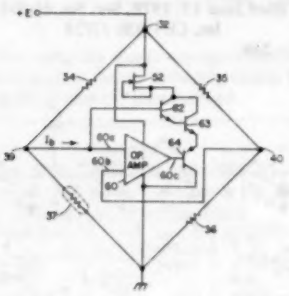
Two delay circuits are shown. One employs a delay line and utilizes the inherent broad band characteristics of such lines to reproduce rectangular pulses after a delay. The other employs a tuned circuit in a narrow band delay system.

3,641,372

TEMPERATURE CONTROLLED MICROCIRCUITS

Norman Green, Timonium; Harold M. Greenhouse, Baltimore; William C. Vergara, Towson, and Robert L. McGill, Jr., Fallston, all of Md., assignors to The Bendix Corporation

Filed Feb. 12, 1970, Ser. No. 10,962
Int. Cl. H03k 17/00
U.S. Cl. 307—310 14 Claims



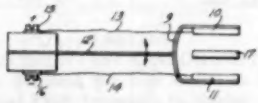
A circuit for stabilizing the temperature of a microcircuit substrate at a constant value includes a sensor in the form of a resistance bridge comprised of both positive and negative temperature coefficient resistors, a control circuit connected across a first set of bridge diagonal points which is powered by the bridge unbalance voltage across these points, and a heater circuit which optionally includes a current limiting device and which is connected across a second set of bridge diagonal points, the heater circuit being controlled by action of the control circuit.

3,641,373

ELECTROSTATIC SYSTEM FOR GENERATING PERIODICAL MECHANICAL VIBRATIONS

Franz Elkuch, Schellenberg, Liechtenstein, assignor to Etablissement Procor, Vaduz, Liechtenstein

Filed Oct. 2, 1969, Ser. No. 863,056
Claims priority, application Switzerland, Oct. 8, 1968, 14948/68
Int. Cl. H02h 1/00
U.S. Cl. 310—6 1 Claim



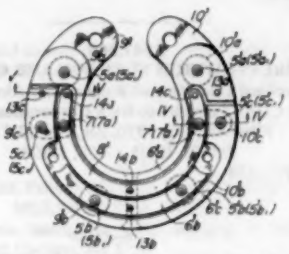
The present invention concerns means for generating periodical mechanical vibrations by means of electric energy, and deals with a greatly simplified and efficacious swing system, which produces mechanical vibratory movements, which system dispenses with any active elements or components except for an energy or current source or cell, the energy losses produced by ohmic resistances in the system being reduced to a minimum and resulting in a high degree of efficiency, reliability and accurate performance.

3,641,374

RECTIFYING MEANS FOR THREE-PHASE ALTERNATING GENERATORS FOR USE IN VEHICLES AND OTHER TRANSPORT FACILITIES

Suguru Sato, Kariya, Japan, assignor to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Jan. 27, 1971, Ser. No. 110,044
Claims priority, application Japan, Mar. 11, 1970, 45/23542
Int. Cl. H02k 11/00
U.S. Cl. 310—68 D 1 Claim



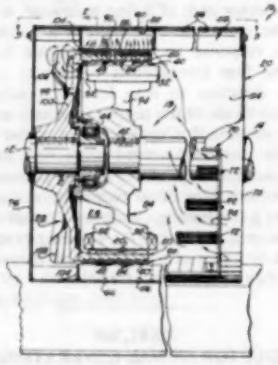
An extremely compact rectifying means capable of providing increased power is provided, which comprises rectifying elements sealed between a printed wiring plate having a neutral lead line and cooling fins, and in which two additional rectifying elements connected to the neutral point are sealed in addition to the conventional six rectifying elements.

3,641,375

TORQUE-TRANSMITTING DEVICE

William H. Moyer, Kenosha, Wis., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed Sept. 4, 1970, Ser. No. 69,702
Int. Cl. H02k 49/04
U.S. Cl. 310—105 18 Claims



An electromagnetic torque-transmitting device or coupling includes a housing for enclosing a drum which extends around and is magnetically coupled with a rotor. The housing defines a chamber which is pressurized with a suitable cooling medium, such as air, which flows around the coupling to cool it during a transmission of torque between the drum and rotor. The pressurized cooling air flows into pockets spaced around the drum and impinges against the drum at circum-

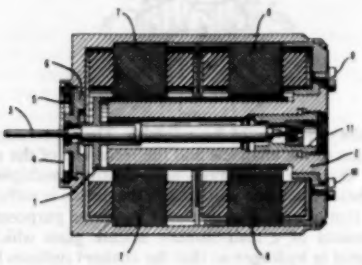
ferentially spaced locations around the drum while passing under a baffle to an exhaust pocket. The cooling air is then exhausted to the atmosphere through conveniently located openings. A plurality of circumferentially extending grooves are formed in an outer wall of the drum to further promote a transfer of heat from the drum to the cooling air.

3,641,376

SINGLE DRAG CUP MOTOR GENERATOR

Douglas J. Livingston, West Chester, Pa., assignor to Harowe Servo Controls Inc., West Chester, Pa.

Filed Jan. 7, 1970, Ser. No. 1,211
Int. Cl. H02k *47/20, 17/42*
U.S. Cl. 310—113 **5 Claims**



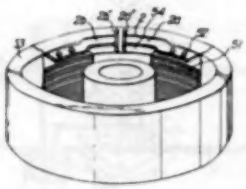
In a miniature motor generator, a drag cup is the rotating electrically conducting element for both the motor and the generator. The drag cup rotates about an iron core. Stator windings are energized to drive the cup as a motor. A second stator winding generates a signal representing rotational speed. In order to prevent interaction and cross coupling between the motor and the generator, the motor stator is wound with a different number of poles than the generator stator.

3,641,377

IGNITION TIMING PULSE GENERATOR FOR A CONTACTLESS IGNITION SYSTEM OF INTERNAL COMBUSTION ENGINES

Minoru Fujii, Kariya, Japan, assignor to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Mar. 20, 1970, Ser. No. 21,396
Claims priority, application Japan, May 15, 1969, 44/37867; May 28, 1969, 44/49471; July 3, 1969, 44/63293
Int. Cl. H02k *21/22*
U.S. Cl. 310—153 **9 Claims**



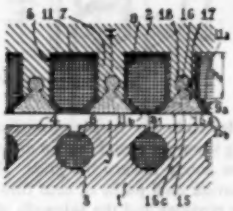
An ignition timing pulse generator for use in a contactless ignition system of an internal combustion engine which includes a magnetodynamo. The pulse generator includes a pair of auxiliary timing poles secured to main magnet poles of the magnetodynamo and disposed to oppose each other and to thereby define an airgap therebetween. Pickup means are also provided and are mounted on the stator of the magnetodynamo with the pickup means including a pickup core shielded by at least one magnetic shielding member and a first pickup coil wound on the pickup core. A second pickup coil is wound on said magnetic shielding member with the first pickup coil being differentially connected to the second pickup coil to produce an ignition timing pulse substantially without any disturbance from stray fields in response to passage of the airgap between the pair of timing poles when the rotor is rotated.

3,641,378

ARRANGEMENT FOR SECURING CONDUCTORS OF STATOR WINDING OF DYNAMOELECTRIC MACHINE

Jacques LeHenaff, Paris, France, assignor to Compagnie Electro-Mecanique, Paris, France

Filed May 22, 1970, Ser. No. 39,760
Claims priority, application France, May 29, 1969, 6917390
Int. Cl. H02k *3/48*
U.S. Cl. 310—214 **6 Claims**



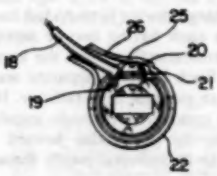
An arrangement for securing the conductor bars of a distributed winding in place on the magnetic circuit of the stator element of a dynamoelectric machine is constituted by spaced-apart insulating pieces each including a heel portion engaged in a complementary configured recess in the stator iron and two tapered lateral projections which bear against the conductor bars only along tapered sides of the latter. The central surface portion of each conductor bar oriented towards the gap between the stator and rotor elements is left exposed. The advantage of the arrangement is that it enables the conductor bars to be brought closer to the rotor.

3,641,379

BRUSH LEAD RETAINER

Stephen L. Vick, Towson, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Sept. 15, 1970, Ser. No. 72,373
Int. Cl. H02k *5/14*
U.S. Cl. 310—239 **9 Claims**



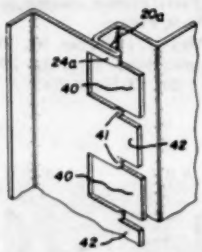
A heavy-duty portable electric tool such as a hammer which includes a universal motor and improved brush lead retaining means. A brush is held adjacent a commutator by means of a conductive brush holder and a conductive lead is attached to the brush holder by means of a fastener. An insulating ring is positioned to prevent the fastener from loosening. The ring also includes a channel-shaped extension which retains the lead and prevents it from moving outwardly toward the housing of the tool if the lead should break loose from the fastener.

3,641,380

ANODE ELECTRODE FOR ELECTRON DISCHARGE DEVICE

Joe F. Stephens, Owensboro, Ky., assignor to General Electric Company

Filed Feb. 24, 1970, Ser. No. 13,576
Int. Cl. H01j *19/36*
U.S. Cl. 313—39 **5 Claims**



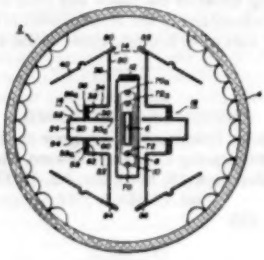
An anode electrode for an electron discharge device is provided having inwardly projecting fin means to electrostatically extend the anode toward the grids. The fin means are arranged to provide dual paths of heat flow from the fins to both the flange portions and the sidewalls of the anode electrode.

3,641,381

ELECTRON DISCHARGE DEVICE

Othmar E. Ringeman, St. Meinrad, Ind., assignor to General Electric Company

Filed Feb. 24, 1970, Ser. No. 13,574
Int. Cl. H01j *19/36*
U.S. Cl. 313—40 **3 Claims**



An electron discharge device is provided having an anode comprising portions each having two or more inwardly extending fins to electrostatically extend the anode toward the interior electrodes. Each fin has a separate and independent direct heat path to an external heat radiator. Heat generated at the fins is thus conducted through angularly displaced thermal paths from the electrodes toward the envelope whereby the heat can be radiated evenly throughout the envelope.

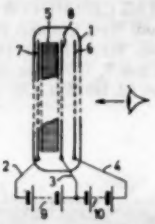
3,641,382

CHANNEL INTENSIFIER GLASS COMPOSITIONS

Derek Cregeen, Concord, N.H., assignor to U.S. Philips Corporation

Filed July 22, 1969, Ser. No. 843,745
Claims priority, application Great Britain, July 31, 1968, 36,567/68
Int. Cl. H01j *43/08*; **H01b** *1/08*; **C03c** *3/04*
U.S. Cl. 313—105 **6 Claims**

An electronic image intensifier employing a resistive matrix in the form of a plate the major surfaces of which constitute the input and output faces of the matrix, a conductive layer on the input face of the matrix serving as an input electrode, a separate conductive layer on the output face of the matrix serving as an output electrode, and elongated channels each providing a passageway from one face of the assembly consisting of the matrix and input and output electrodes to the other face of the assembly. The distribution and cross section of the channels and the resistivity of the matrix are such that the resolution and electron multiplication characteristic of any one unit area of the device is sufficiently similar to that of any other unit area for image purposes. The matrix consists of a lead-bismuth silicate glass which has been reduced in hydrogen so that the channel surfaces have a conductive reduced oxide layer with a resistivity in the range 10^{10} to 10^{14} ohms/square.

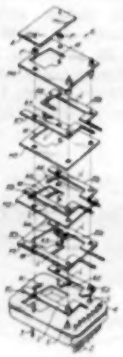


3,641,383

GLOW DISCHARGE TUBE FOR CODE DISPLAY

Hazime Tagawa, Takatsuki-shi, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Filed Sept. 22, 1969, Ser. No. 859,819
Claims priority, application Japan, Sept. 25, 1968, 43/70664
Int. Cl. H01j *61/66*
U.S. Cl. 313—109.5 **5 Claims**



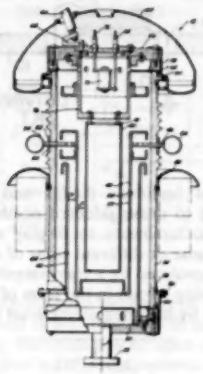
A glow discharge tube for code display in which a plurality of cold cathodes in the shape of a plate comprising a segmented portion forming a luminous code and a lead connected to that portion are piled up with a window-frame-shaped insulating plate interposing between each layer to construct a cold cathode structural body and interposing the said lead between the said insulating plates in order to prevent a negative glow at the said lead portion.

3,641,384

SWITCHING DEVICE

Roger E. Lund, Cottage Grove, Minn., and Gunter A. G. Hofmann, Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 16, 1970, Ser. No. 19,563
Int. Cl. H01j *1/50*
U.S. Cl. 313—161 6 Claims



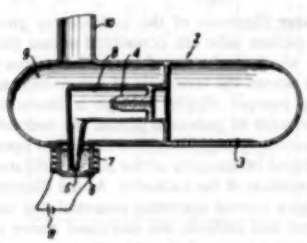
The switching device has three spaced electrodes with a gas-filled annular space therebetween. When an axial magnetic field above a certain value is applied to the gas-filled space, and after initiation, cascading ionization occurs for conduction. The electrodes can be electrically serially connected for higher holdoff voltage during nonconduction, or can be electrically connected in parallel for higher current capacity in the same envelope.

3,641,385

GAS-FILLED DISCHARGE TUBE WITH GAS-REFILLING MEANS

Taizo Oikado, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed June 24, 1970, Ser. No. 49,380
Claims priority, application Japan, June 30, 1969, 44/52065
Int. Cl. H01j *17/26, 61/24*
U.S. Cl. 313—175 2 Claims



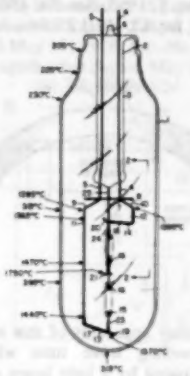
A unit for supplying gas to a gas-filled discharge tube includes a gas container and a reservoir in communication therewith. The reservoir has an outlet portion and valve means are provided at the reservoir outlet to selectively place the reservoir in and out of fluid communication with a chamber. The latter in turn communicates with the interior of the discharge tube.

3,641,386

TUNGSTEN HALOGEN LAMP

Emery G. Audesse, Salem; Robert M. Griffin, South Hamilton; Alexander Tartakoff, Beverly, and John J. Gutta, Hamilton, all of Mass., assignors to Sylvania Electric Products, Inc.

Filed July 23, 1970, Ser. No. 57,556
Int. Cl. H01j *61/26*
U.S. Cl. 313—179 5 Claims



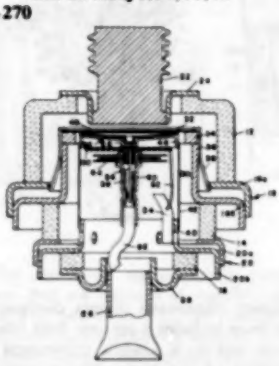
A tungsten halogen lamp in hard glass in which the temperature gradient in the envelope is such that the top of the latter is at about 200° C. and the remainder of the lamp hotter, so that the halogen will not only keep the glass bulb clear by means of the usual regenerative halogen cycle, but will also react with impurities in the tungsten to condense them out nonregeneratively on the top of the envelope, the lamp being operated base up. To insure the proper operation of the halogen cycle, the supporting conductors for the filament are made small enough to operate at incandescence at the designed current, in contrast to the much larger diameter used for supporting conductors in ordinary incandescent lamps, where the wires operate comparatively cool and have low resistance and voltage drop. The higher voltage drop in the incandescent supporting conductor is compensated for by designing the filament coil to operate at its desired temperature at lower voltage in an atmosphere of bromine and krypton.

3,641,387

PRESTRESSED CATHODE STRUCTURE FOR ELECTRON DISCHARGE DEVICES

Herbert L. Sholl, East Norwalk, Conn., assignor to The Machlett Laboratories, Incorporated, Springdale, Conn.

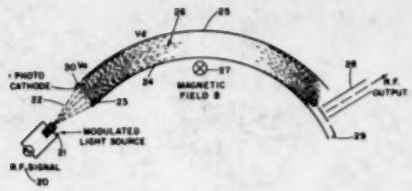
Filed Apr. 2, 1970, Ser. No. 25,130
Int. Cl. H01j *1/94, 19/48*
U.S. Cl. 313—270 8 Claims



A planar-type cathode for electron discharge devices which is in relatively close-spaced relation with another elec-

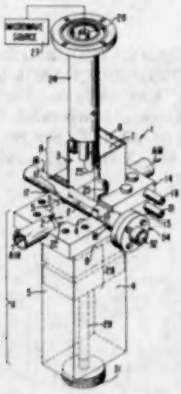
trode and which is provided with means for preventing bowing toward the electrode under thermal stresses.

3,641,388
MICROWAVE DELAY APPARATUS
Erwin F. Belohoubek, Kendall Park, N.J., assignor to The United States of America as represented by the Secretary of the Navy
Filed Oct. 5, 1965, Ser. No. 493,275
Int. Cl. H01j 25/34
U.S. Cl. 315—3.5 5 Claims



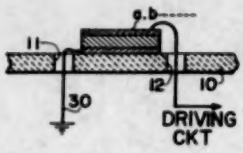
The microwave delay apparatus of this invention consists of an M-type travelling wave tube which employs a photocathode illuminated by a light beam amplitude modulated at the signal frequency as the apparatus for forming and injecting the modulated beam into the drift region. This arrangement permits a laminar beam filling the drift space to be launched into the interaction region where the crossed electric and magnetic fields occur. It eliminates the usual electron gun, its associated beam forming electrodes and the input coupler.

3,641,389
HIGH-POWER MICROWAVE EXCITED PLASMA DISCHARGE LAMP
William J. Leidigh, Belmont, Calif., assignor to Varian Associates, Palo Alto, Calif.
Filed Nov. 5, 1969, Ser. No. 874,175
Int. Cl. H01j 7/46, 19/80
U.S. Cl. 315—39 9 Claims



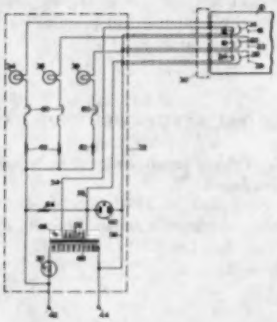
A high-power microwave plasma discharge lamp is disclosed. The lamp includes a ceramic tube filled with gas and closed at one end by a window transparent to the optical radiation output of the lamp. The ceramic tube extends through a cavity resonator excited with microwave energy for exciting a plasma discharge within the lamp.

3,641,390
SOLID-STATE LETTER DISPLAY DEVICE
Tadashi Nakamura, Ise-City, Japan, assignor to Ise Electronics Corporation, Ise-City, Japan
Filed June 5, 1969, Ser. No. 830,706
Claims priority, application Japan, July 9, 1968, 43/47619
Int. Cl. H05b 37/00
U.S. Cl. 315—169 1 Claim



A plurality of luminous diodes and a driving circuit therefor adapted to cause selected combinations of the luminous diodes to luminesce to display selected letters are formed on the same or different sides of a substrate and the assembly is encapsulated by a transparent molded protective coating. The driving circuit in the form of a diode matrix circuit is fabricated by the integrated circuit technique.

3,641,391
DEVICE FOR RESTORING CATHODE EMISSION IN CATHODE-RAY TUBE GUNS
Albert R. Badewitz, Vancouver, Wash., assignor to Beltron, Inc., Vancouver, Wash.
Filed June 6, 1969, Ser. No. 842,073
Int. Cl. H01j 9/50
U.S. Cl. 316—28 10 Claims



The heater filaments of the cathode-ray guns of a color television picture tube are connected across the low-voltage secondary winding of a transformer, the primary of which is connected across the terminals of a conventional household alternating current supply through a thermistor to effect gradual increase of potential across the secondary winding. As the filament voltage increases to normal operating potential, the degree of intensity of the lamps indicates the relative electron emission of the cathodes. As the filament voltage increases above normal operating potential, the temperature of the filament and cathode are increased above normal to effect progressive removal of contaminating materials from the cathodes. The cathodes are connected to one terminal of the alternating current supply and the control grids are connected to the other terminal of the alternating current supply each through a dropping resistance, circuit breaker and indicator lamp, to produce a pulsating direct current which effects progressive drawing of fresh electron emissive material to the surface of the cathodes. This automatic progressive restoration of the cathode is evidenced by progressive

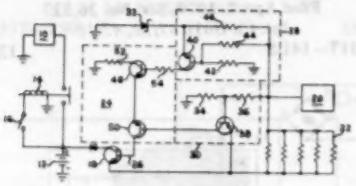
brightening of the lamps and when restoration of each cathode is completed, the associated circuit breaker opens automatically to terminate the treatment.

3,641,392

ELECTRICAL DEMAND PRIORITY CIRCUIT

William E. Coman, Newport, N.Y., assignor to The Bendix Corporation

Filed Mar. 23, 1970, Ser. No. 21,568
Int. Cl. H02h 7/09
U.S. Cl. 317—13 R 4 Claims



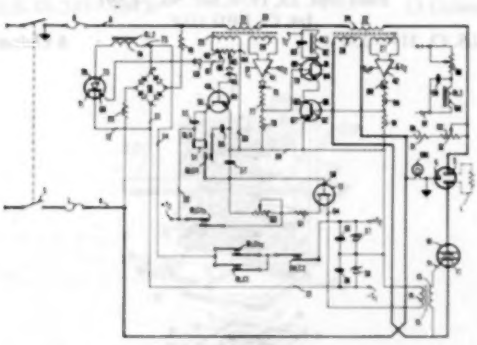
A circuit for controlling the provision of electrical energy to an accessory circuit in accordance with an established priority and the energy demands placed upon the remainder of the system by the other accessories powered therefrom is disclosed herein. The circuit includes a control transistor which provides an electrical interconnection between the vehicle bus bar and the accessory and its accessory battery. When the demands placed upon the remainder of the electrical circuit are high the control transistor limits or terminates the flow of energy to the high demand accessory portion of the circuit.

3,641,393

AUTOMATIC GROUND FAULT CIRCUIT INTERRUPTER

Douglas A. Florance, 1110 Hillside Drive, Vestal, N.Y.; Lloyd P. Nordholm, 1515 W. Addorra Drive, Phoenix, Ariz., and Stephen Foldes, 5 Riverside Drive, Binghamton, N.Y.

Continuation-in-part of application Ser. No. 828,836, May 29, 1969, now Patent No. 3,558,980. This application Jan. 25, 1971, Ser. No. 109,505
Int. Cl. H02h 3/28, 7/26
U.S. Cl. 317—22 3 Claims



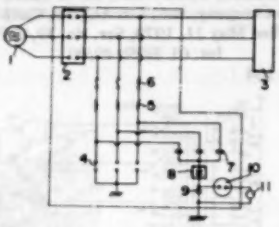
A power distribution system with automatic ground fault and overload protection is described. In series with the conductors of a powerline are placed current coils representing primary windings of a transformer connected in cancelling phase relation. The secondary windings of a transformer connected in cancelling phase relation. The secondary windings are energized by virtue of a predetermined reference current through one of the primary windings. The induced electromotive force due to reference current is cancelled by a ground fault leakage current. Switching means are actuated, effecting disconnection of the live conductor in accordance with excitation of the secondary windings.

3,641,394

VACUUM SWITCH ASSEMBLY

Kengo Hirose, Tokyo; Noboru Ishiwata, Yokosuka, and Todaomi Hukawa, Odaware, all of Japan, assignors to Toyo Denki Seizo Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1970, Ser. No. 38,659
Claims priority, application Japan, May 22, 1969, 44/39453
Int. Cl. H02h 3/26
U.S. Cl. 317—27 R 5 Claims



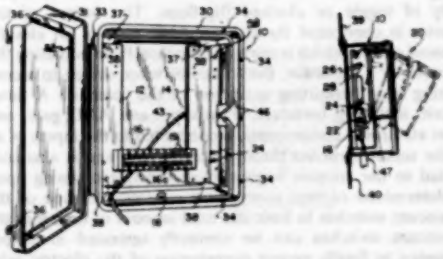
A polyphase vacuum switch assembly having a plurality of vacuum switching valves, a star-connected surge-absorbing unit connected in parallel with a load circuit, and a star-connected unbalance-detecting unit connected substantially in parallel with the surge-absorbing unit. The surge-absorbing unit repeatedly absorbs frequently occuring switching surge voltages while effecting emergency backup absorption of lightning surges with follow-current interruption by melting fuses incorporated therein. The unbalance-detecting unit detects the melting of the fuse and other unbalance of the load circuit.

3,641,395

APPARATUS FOR QUICKLY MOUNTING AND ELECTRICALLY CONNECTING COMPONENTS IN A HOUSING WITH CAMMING CONNECTOR ARRANGEMENT

Melvin S. Nation, Bensenville, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 28, 1970, Ser. No. 84,835
Int. Cl. H02b 1/04
U.S. Cl. 317—117 10 Claims



A housing for electronic equipment is provided with sidewall brackets that are secured in parallel relation with one another and with pins formed on the bracket to receive and guide a support rack containing electric or electronic components thereon. Rack receiving pins engage a first pair of slots on the support rack while guide pins engage a second pair of slots which are angularly formed in the support rack so that movement of the guide pins within the second slots

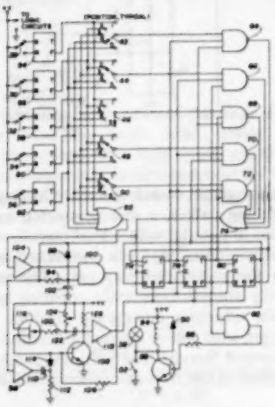
provides a cam action to urge the entire support rack into electrical connection with fixedly mounted quick connectors secured to a barrier strip which is secured within the housing. The quick connectors are trifurcated female connectors to receive male connectors during the inserting operation of the support rack, and the trifurcated connectors are resilient to allow for slight angular movement between the connectors during their interconnection.

3,641,396

ELECTRICALLY ACTUATED SWITCH COMBINATED OPERATING DEVICE FOR PERMITTING OPERATION OF LATCHES AND OTHER MECHANISMS

Dale J. Kossen, Orange; Richard W. Foster, Glendale, and Charles R. Benson, Costa Mesa, all of Calif., assignors to Alarm Lock Company, Inc., Los Angeles, Calif.

Filed May 21, 1970, Ser. No. 39,470
Int. Cl. E05b *49/00*
U.S. Cl. 317—134 **14 Claims**



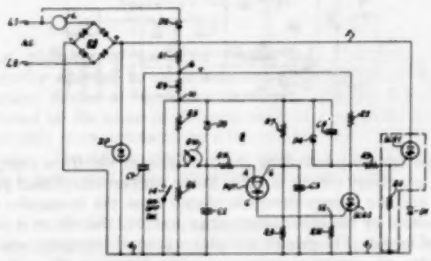
A plurality of normally off, pushbutton secure switches are located at an outer side and a same plurality of presettable, multiple positionable, secure switches are located at an inner side of a door guarded by a latch, with the first nonsecure switch being electronically connected through a set-reset flip-flop to the first position of all of the secure switches, the second nonsecure switch through a set-reset flip-flop to the second position of all of the secure switches and so forth. The output of each of the secure switches is connected to the input of an AND gate and the output of all of the AND gates are connected to the inputs of an OR gate, with the output of the OR gate and the other inputs of all of the AND gates being connected to an electronic counter formed by a plurality of toggle or clocked flip-flops. The output of the counter is connected through an AND gate of an electric solenoid circuit which is normally blocked from actuating the solenoid by a transistor, the transistor when driven to a conducting state permitting actuation of the solenoid. A timer circuit, including inverters, transistors, and AND gate, and other electronic components, is connected to the inputs of all of the secure switches through an OR gate and is also connected to the counter beginning an electronic timing upon predetermined correct momentary operation of one of the nonsecure switches to limit the total amount of time that the nonsecure switches can be correctly operated in proper sequence to finally permit energization of the electric solenoid. Thus, with the electrical circuitry including the electronic components, the secure switches may be set to any combination of multiple settings which determines the required sequence of operations of one or more of the nonsecure switches, the secure switches in their connection in the circuit requiring transmission therethrough in order or sequence. In the sequence of operation of the nonsecure switches does not follow the order of secure switches, the entire circuitry is reset to starting position including the timer circuit and if the time period of the timer circuit expires the entire circuitry is reset, thereby requiring exact operation of the nonsecure switches within a determined time period in order to energize the solenoid. The solenoid is mounted blocking operation of the latch guarding the door so that when the solenoid is energized, the latch can be operated and the door opened.

3,641,397

OFF-DELAY SOLID-STATE TIMER SYSTEMS

William H. Elliot, Whitefish Bay, and Isadore Small, III, Milwaukee, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 8, 1970, Ser. No. 26,527
Int. Cl. H01h *47/32, 47/18*
U.S. Cl. 317—141 S **13 Claims**



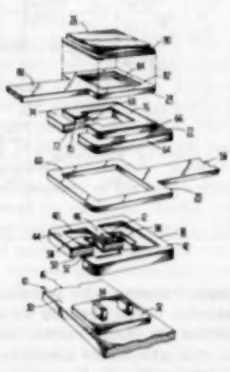
AC and DC solid-state timers for controlling loads such as electromagnetic relays or the like. The timer is supplied through a rectifier from the AC source and provides a time delay after opening of the control circuit; that is, when the control switch is moved to "off" position, the timer delays drop out of the relay for a predetermined, adjustable time interval. The timing can be cancelled at any time before relay dropout by moving the control switch back to "on" position and this will not affect relay energization. A second version works equally well on AC or DC power. A third version returns the load to the condition it was in before power failure when the power comes back on.

3,641,398

HIGH-FREQUENCY SEMICONDUCTOR DEVICE

William Vincent Fitzgerald, Jr., Basking Ridge, N.J., assignor to RCA Corporation

Filed Sept. 23, 1970, Ser. No. 74,591
Int. Cl. H01l *1/14*
U.S. Cl. 317—234 G **6 Claims**



The device envelope comprises a plurality of members, some of which are electrically conductive, and others of

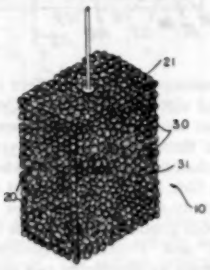
which are electrically insulating, the various members being in stacked relationship, and some of the conductive members serving as device terminals. The various members are brazed to one another, the brazed joints on opposite surfaces of each of the insulating members not overlapping.

3,641,399

CLUSTER ANODE FOR ELECTROLYTIC CAPACITORS

Gerhart P. Klein, Manchester, and Ivan L. Wingood, Bedford, both of Mass., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed June 10, 1970, Ser. No. 44,927
Int. Cl. H01g 9/04
U.S. Cl. 317—230 **15 Claims**



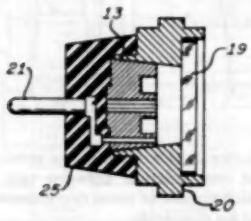
The application describes a film-forming metal anode preferably tantalum made from microporous droplets with interdroplet spaces that facilitate the penetration of the anodes by processing materials. Capacitors made from such anodes exhibit one or more of the following characteristics; improved DC leakage, lower DF, improved wide frequency characteristics.

3,641,400

LIGHT-EMITTING SEMICONDUCTOR RADIAL ARRAY

Eugene S. Rocks, Northport, and Thomas J. Poff, Dix Hills, both of N.Y., assignors to Sperry Rand Corporation

Filed July 16, 1970, Ser. No. 55,307
Int. Cl. H05b 33/00
U.S. Cl. 317—234 R **13 Claims**



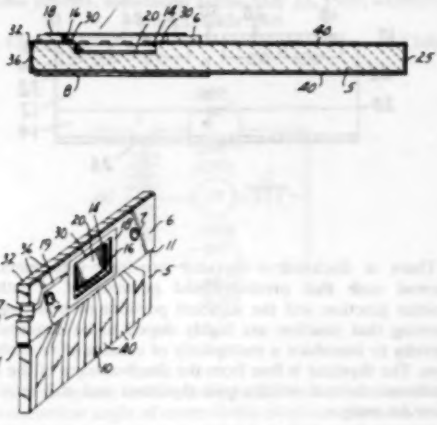
A light source including a radially disposed array of laser diodes each located in a centralized region between respective angularly spaced wedge-shaped electrically conductive sections which are arranged in a circularly symmetric configuration having a casing thereabout for holding the respective diodes and wedge sections in contacting relation. Electrical excitation is applied to the structure by means of contacts affixed to two of the wedge sections devoid of a diode therebetween whereby electrical series connections of the diodes is established to induce lasing action therein.

3,641,401

LEADLESS CERAMIC PACKAGE FOR INTEGRATED CIRCUITS

James E. Lynch, Chattanooga, Tenn., assignor to American Lava Corporation, Chattanooga, Tenn.

Continuation of application Ser. No. 843,460, July 22, 1969, now abandoned. This application Mar. 10, 1971, Ser. No. 123,050
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R **7 Claims**



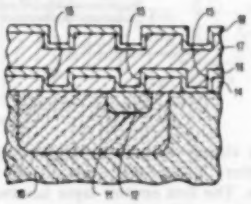
A plug-in leadless package for integrated circuits is provided having integral male contact members supported by ceramic backing. The package is adapted to connection by spring connectors or by soldering in mating female receptacles.

3,641,402

SEMICONDUCTOR DEVICE WITH BETA TANTALUM-GOLD COMPOSITE CONDUCTOR METALLURGY

Martin Revitz, Poughkeepsie, and Francis E. Turene, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,203
Int. Cl. H01l 1/14
U.S. Cl. 317—234 R **5 Claims**



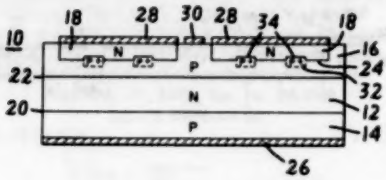
A deposited film of gold is adhered to a layer of silicon dioxide by a deposited film of Beta tantalum. After the gold is deposited on the Beta tantalum, a second film of Beta tantalum is deposited on the gold. This forms a composite sandwich adhering the gold to the silicon dioxide without decreasing the conductivity of the gold and allowing another layer of silicon dioxide to be adhered to the second film of Beta tantalum.

3,641,403

THYRISTOR WITH DEGENERATE SEMICONDUCTIVE REGION

Josuke Nakata, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1970, Ser. No. 41,130
Int. Cl. H01l 11/00, 15/00
U.S. Cl. 317—235 R 6 Claims



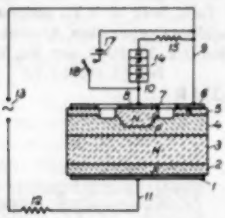
There is disclosed a thyristor provided with junctions formed such that predetermined portions of a cathode emitter junction and the adjacent portions of both regions forming that junction are highly doped to be degenerated thereby to introduce a multiplicity of centers of recombination. The thyristor is free from the disadvantages of the conventional shorted emitter-type thyristors and still retaining their advantages.

3,641,404

THYRISTOR CIRCUIT

Svedberg Per, Vallingby, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed June 5, 1969, Ser. No. 830,807
Claims priority, application Sweden, June 5, 1968, 7485/68
Int. Cl. H01l 11/00, 15/00
U.S. Cl. 317—235 R 8 Claims



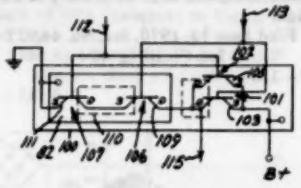
A thyristor circuit includes a first thyristor with first and second emitter layers and two base layers arranged therebetween. The first emitter layer has two separate parts. The first part is provided with a connection for the load current of the thyristor. A second thyristor is connected between the second part of the first emitter layer and the load current connection to the first part. The breakover voltage in the forward direction of the series connection of the second thyristor and the partial thyristor composed of the second part of the first emitter layer and the other layers of the first thyristor is lower than the breakover voltage of the first thyristor. As a result, upon increase of off-state voltage the second thyristor breaks over first with the production of a simultaneous ignition over a large surface.

3,641,405

FIELD-EFFECT TRANSISTORS WITH SUPERIOR PASSIVATING FILMS AND METHOD OF MAKING SAME

Dale M. Brown, Schenectady, and William E. Engeler, Scotia, both of N.Y., assignors to General Electric Company

Original application Oct. 13, 1967, Ser. No. 679,957, now Patent No. 3,566,518, dated Mar. 2, 1971. Divided and this application Dec. 16, 1969, Ser. No. 885,660
Int. Cl. H01l 11/14
U.S. Cl. 317—235 R 9 Claims



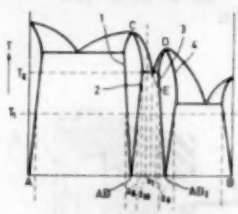
Improved semiconductor field-effect transistors have self-registration and electrical insulation. Conductivity-modified, surface adjacent source and drain regions are formed by diffusing dopants through gate-oxide layer. One embodiment features a conducting gate electrode which is formed from a thin deposited film. In this embodiment a large region of opposite-conductivity-type semiconductor is formed by diffusion through both conducting and oxide films. Complementary "N-channel" and "P-channel" devices may be formed on the same substrate by combining two separate embodiments. In such devices the original conductivity-type semiconductor is the base for one FET, while the large conductivity-modified-type region is the base for the other FET. Such modules may be interconnected to form integrated circuits capable of performing a variety of logical functions.

3,641,406

SEMICONDUCTOR HETEROJUNCTION DEVICE

Wouter Albers, and Jacobus Verberkt, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 3, 1969, Ser. No. 854,896
Claims priority, application Netherlands, Sept. 4, 1968, 6812544
Int. Cl. H01l 3/00
U.S. Cl. 317—237 5 Claims



A semiconductor device including a semiconductor body having at least one junction between two semiconductor compounds which consist of same two elements, for example tin selenide and tin diselenide.

3,641,407

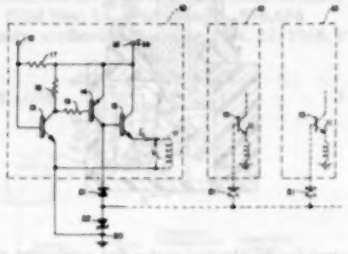
INDUCTOR SURGE PROTECTION FOR TRANSISTORS

Richard D. Scott, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Oct. 26, 1970, Ser. No. 84,041
Int. Cl. H02h 7/20
U.S. Cl. 317—43 17 Claims

A circuit for clamping a voltage induced across an inductor utilizes a Zener diode to control the energy dissipation of the inductor through a transistor. A driver circuit for an in-

ductor includes a Zener diode and an opposing diode connected across the series combination of the base-emitter junction of an emitter-follower output transistor and the inductor driven thereby. When the transistor is conducting, the inductor is energized and no current flows through the Zener diode. When the transistor is caused to cease conduction, the field of the coil of the electromagnet collapses, generating a voltage that is applied to the emitter of the output transistor. If the voltage thus generated is greater than the Zener breakdown voltage, the Zener diode breaks down and provides a bias current to the base of the output transistor to permit



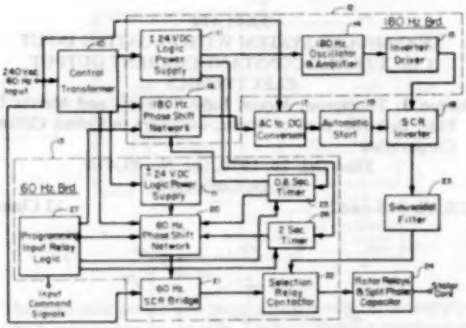
further conduction of the transistor and clamps the voltage at the emitter of the transistor to substantially the value of the Zener breakdown voltage. The voltage generated by the inductor is thus prevented from applying too high a voltage across the collector-emitter circuit of the output transistor, which might damage the transistor. The transistor continues to conduct during the dissipation of the energy stored in the inductor until the inductor is almost fully deenergized and can no longer generate a voltage equal to the Zener diode breakdown voltage. The output transistor is then rendered nonconductive, completing the deenergization of the inductor.

3,641,408

SOLID-STATE POWER SUPPLY SYSTEM FOR ROTATING ANODE X-RAY TUBES

Louis L. Fiocca, c/o Advanced Instrument Development Inc. 1001 North 25th Ave., Melrose Park, Ill.

Filed Aug. 24, 1970, Ser. No. 66,348
Int. Cl. H02p 5/40
U.S. Cl. 318—227 **18 Claims**



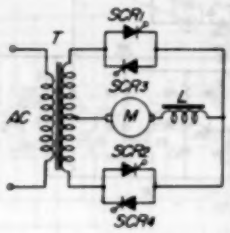
A compact solid-state power supply system for rotating anode X-ray tubes. The system includes an AC-to-DC solid state power converter which drives an inverter oscillator using silicon controlled rectifiers. The system provides means for operating the rotating X-ray tube anode at either low or high speeds with automatic braking when going from high speed to low speed. Means are also provided for automatically restarting the system in the event of paralysis of the inverter oscillator. Further, through the use of a novel programmed two-step driving signal, the desired operating speed is reached in a fraction of a second. The unit is compact and lightweight for optimum ease of installation.

3,641,409

CONTROL SYSTEM FOR DC MOTOR

Yutaka Maeda, and Kinya Hirata, both of Aichi-ken, Japan, assignors to Okuma Machinery Works Ltd., Nagoya, Japan

Filed Oct. 8, 1969, Ser. No. 864,629
Claims priority, application Japan, May 23, 1969, 44/40374
Int. Cl. H02r 5/06
U.S. Cl. 318—258 **4 Claims**



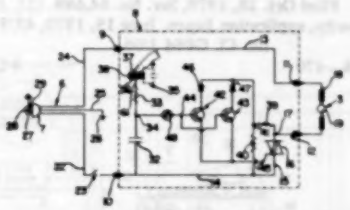
A control system for controlling a DC motor by controlling the conduction angle of controllable electric valves, wherein in order to discharge energy stored in a choke coil connected in series with the armature of the DC motor, the controllable electric valves including rectifiers are connected in parallel with the series circuit of the DC motor and choke coil for the control of unidirectional rotation, and a reverse parallel circuit consisting of controllable electric valves is connected in parallel with said series circuit for the reversible control.

3,641,410

TOUCH CONTROL FOR ELECTRICAL APPARATUS

Walter H. Vogelsberg, Carversville, Pa., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Apr. 30, 1970, Ser. No. 33,202
Int. Cl. H02p 7/00
U.S. Cl. 318—345 **22 Claims**



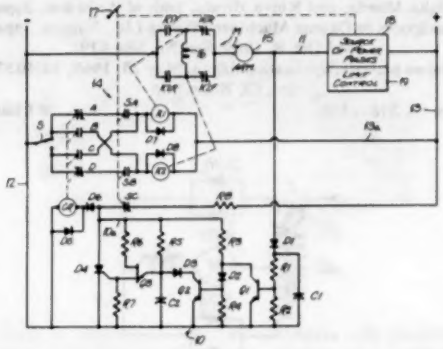
A touch control to energize the load of a tool or appliance. A timing circuit gates a triac ON to energize the load in response to a touch or touch device having no moving parts. The touch device in one embodiment is an impedance without moving parts and the value of which varies with the location of the operator's touch to vary the timing of the circuit and, correspondingly, to provide for variable energization of the load. The impedance can be a capacitor or a resistor. Another embodiment includes several impedances and several touch devices to provide for selective energization of the load of a predetermined extent.

3,641,411

DYNAMIC AUTOMATIC BRAKING FOR TRUCK

Robert V. Nemiroff, Philadelphia, Pa., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed Sept. 20, 1967, Ser. No. 669,029
Int. Cl. H02p 3/06
U.S. Cl. 318—373 12 Claims



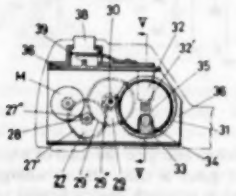
A dynamic braking system utilizing a switch that is operated by the accelerator of the truck, and that acts through a relay to move contacts that electrically reverse the traction motor of the truck when the accelerator moves to neutral position. The traction motor is driven by pulsating power that is applied also when the accelerator is in neutral position so as to brake the truck. Pulse limit means control the motor current while braking, and permit an increase in the pulse duty cycle when the truck substantially comes to rest and the braking effect ceases. The duty cycle, upon reaching a certain value, acts through the charging of a capacitor to operate transistors forming parts of a control circuit. That causes a silicon controlled rectifier to bypass the relay, causing the motor reversing contacts to return to a normal position. The accelerator while in neutral holds further contacts open so as to prevent a movement of the truck when the reversing contacts move to normal position.

3,641,412

MOTOR CONTROL CIRCUIT FOR PAD HOLDER

Chusaku Hayashi, Tokyo, Japan, assignor to Hayashi Seisakusho Co., Ltd., Sumida-ku, Tokyo, Japan

Filed Oct. 28, 1970, Ser. No. 84,669
Claims priority, application Japan, June 15, 1970, 45/59334
Int. Cl. G05d 3/06
U.S. Cl. 318—470 4 Claims



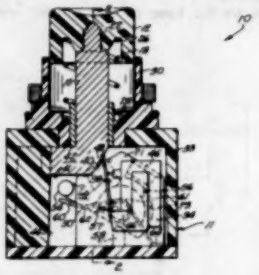
A writing pad holder is disclosed which incorporates an automatic feed control mechanism for feeding a length of pad from its roll, said mechanism including an electrical switch operable to start and stop a drive motor, said switch being associated with a switching gear and adapted to close during a full cycle of revolution of the switching gear.

3,641,413

PHOTOELECTRIC MOTOR CONTROL

Frederick F. Ohntrup, Plymouth Meeting, Pa.; John P. Truemper, West Helena, and Billy C. Smith, Forrest City, both of Ark., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed Dec. 16, 1970, Ser. No. 98,789
Int. Cl. H02p 7/14
U.S. Cl. 318—480 10 Claims



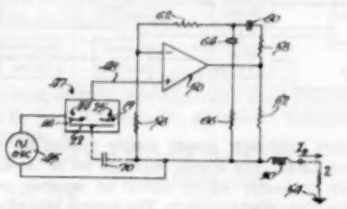
A control for an electric motor for producing a first control signal for controlling the speed of the motor and a second control signal for controlling the direction of rotation of the motor includes a pair of photocells connected in series across a power supply, a light source for illuminating the photocells, a movable mask for controlling the intensity of illumination on each of the photocells, a pair of switches and a pair of actuator members one of which is associated with each of the switches. An output terminal is connected between the series-connected photocells for producing the first control signal, the magnitude of which controls the speed of the motor, and is dependent upon the resistance of the photocells and hence the intensity of illumination acting thereon. The switches produce the second control signal. Initial movement of one of the actuating members effects activation of its associated switch to thereby produce the second control signal and further movement of the actuating member effects movement of the mask to thereby control the intensity of illumination acting on the photocells so as to control the magnitude of the first control signal. Thus, movement of one of the actuating members controls the direction of rotation of the motor associated with the control and the magnitude of movement of the actuating member controls the speed of the motor.

3,641,414

TRANSDUCER SYSTEM WITH FLOATING INPUT CIRCUIT AND CONSTANT CURRENT OUTPUT ELECTRONICS

Burton J. Thompson, Mount Lake Terrace, and Melvin O. Eide, Bellevue, both of Wash., assignors to United Control Corporation

Filed Oct. 16, 1970, Ser. No. 81,474
Int. Cl. G05b 1/06
U.S. Cl. 318—662 11 Claims



A servoed transducer system uses differential sensing capacitors to detect the movement of a pivoted seismic mass.

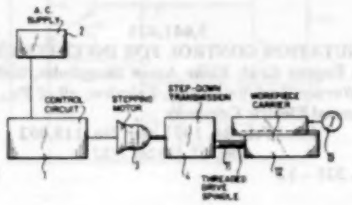
Electrostatic forces across the sensing capacitors are reduced by electrically floating the capacitors and using stray capacitance to a torque coil on the seismic mass to complete a pickoff sensor and detector circuit which generates an error signal in response to movement of the seismic mass. A servoamplifier maintains a constant current through the torque coil for a fixed error signal in order to rebalance the seismic mass.

3,641,415

OPEN-LOOP STEPPING MOTOR CONTROL CIRCUIT FOR A MACHINE TOOL

Ernst A. Weinz, Auf der Bliz, Idar-Oberstein, Germany

Filed Nov. 14, 1969, Ser. No. 876,656
Claims priority, application Germany, Nov. 22, 1968, P 18 10 264.2
Int. Cl. G05b *19/40*
U.S. Cl. 318—696 1 Claim



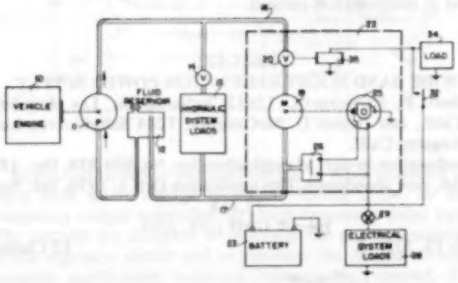
A tool or workpiece slide on a machine tool is advanced in uniform steps by an interruptor in the energizing circuit of the motor driving the slide. A counter which counts the steps stops the advancing movement of the slide after a desired movement of the tool or workpiece. The counter may be set manually. The invention resides in features of the motor circuit and associated controls.

3,641,416

HYDRODYNAMIC CHARGING SYSTEM

James A. Riff, Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 8, 1969, Ser. No. 864,648
Int. Cl. H02j *7/14*
U.S. Cl. 320—61 5 Claims



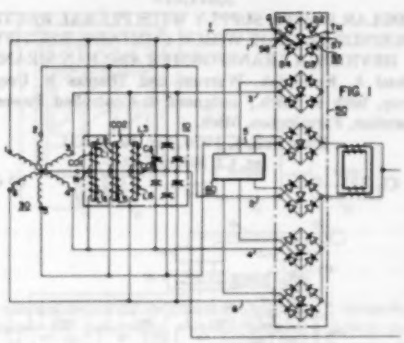
The hydraulic power source of a motor vehicle for supplying hydraulic power to operate a power steering mechanism or other hydraulic equipment of the vehicle is also utilized to drive a hydraulic motor, which in turn is coupled to an alternator through a direct mechanical drive, thereby eliminating the driving belt normally utilized to operate the alternator of the vehicle. The alternator operates as a current source to charge the vehicle battery. The hydraulic system provides sufficient pressure to drive the alternator at its full output even for an idling engine. When electrical power is not required by the system, the fluid supply powering the motor which drives the alternator may be shut off automatically, thereby extending the system life.

3,641,417

INPUT FILTER CIRCUIT FOR CYCLOCONVERTER APPARATUS

Laszlo Gyugyi, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 15, 1970, Ser. No. 72,392
Int. Cl. H02m *1/12, 5/30*
U.S. Cl. 321—7 5 Claims



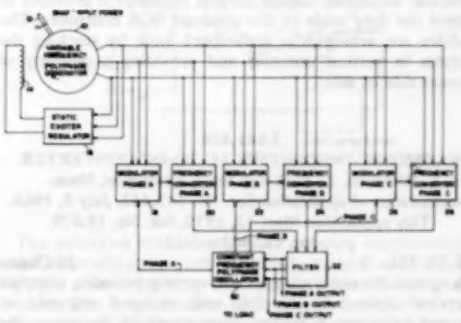
The invention relates to an electrical filter circuit operatively coupled between the output of a polyphase power source exhibiting measurable impedance and the inputs of a cycloconverter apparatus; the filtering circuit including coupled inductors connected between phases of the power source to shunt the unwanted frequency components generated by the cycloconverter apparatus in order to decrease the distortion of the terminal voltage of the polyphase power source, and to improve the input power factor of the cycloconverter.

3,641,418

FREQUENCY CONVERSION SYSTEM

David L. Plette, Waynesboro, Va., assignor to General Electric Company

Filed Mar. 21, 1966, Ser. No. 536,149
Int. Cl. H02m *5/16, 5/30*
U.S. Cl. 321—7 36 Claims



A power conversion system including a static cycloconverter for converting a varying input frequency signal to an output signal of constant frequency. The cycloconverter consists of a plurality of pairs of static switching devices such as

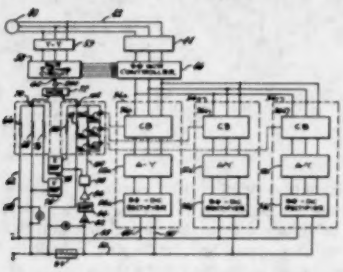
silicon-controlled rectifiers which are selectively triggered into conduction to produce an output wave of the desired constant frequency. The varying input frequency signal is applied to the SCRs to furnish the supply voltage for the anode-cathode path. In addition, a reference voltage of the desired output frequency is applied along with the varying input frequency signal to a modulator for providing firing or triggering pulses for the SCRs as a function of the relative amplitudes of the reference and input signal. The modulator thus produces triggering pulses which vary in time with the signals to provide an average current which varies sinusoidally at the same frequency as the reference voltage.

3,641,419

MODULAR POWER SUPPLY WITH PLURAL RECTIFIER HOUSINGS BACK OF WHICH CONTAINS RECTIFYING DEVICES, A TRANSFORMER AND FAN MEANS

Michael A. Koltuniak, Warren, and Thomas N. Urquhart, Troy, both of Mich., assignors to Controlled Power Corporation, Farmington, Mich.

Filed Feb. 6, 1970, Ser. No. 9,331
Int. Cl. H02m 7/00
U.S. Cl. 321—8 C 10 Claims



A modular power supply for converting three-phase alternating current to direct current for high kva applications. A plurality of individual rectifying modules are all fed through a common three-phase SCR controller. Each module in turn comprises a delta-wye transformer and a three-phase, full wave diode rectifying circuit. An individual cooling fan is packaged with the transformer and rectifying circuit of each module in a confined package. The transformer in each module is fed from the common SCR controller to an individual circuit breaker associated with each module but separately packaged in the module bank immediately adjacent its associated module. The DC output from each module is collected by a common bussing arrangement and a particular automatic voltage-current regulator is provided to control the duty cycle of the common SCR controller. The modules are arranged in a compact bank by stacking the modules in vertical columns and providing a plurality of columns side by side.

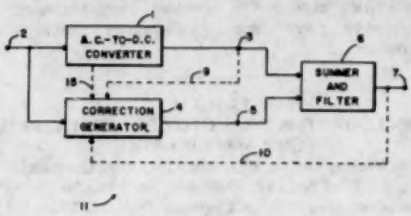
3,641,420

HARMONIC-INSENSITIVE AC-TO-DC CONVERTER

Peter L. Richman, 22 Barberry Road, Lexington, Mass.

Continuation of application Ser. No. 743,442, July 9, 1968. This application Mar. 12, 1970, Ser. No. 19,079
Int. Cl. H02m 1/12
U.S. Cl. 321—9 26 Claims

A system for converting a time-varying periodic, complex electrical input wave to DC with reduced response to selected harmonic distortion components of the wave, the system including a conventional AC–DC converter and means for selectively altering the gain of the converter between predetermined phase angles with respect to the fundamental of the wave. Gain alteration is typically effected by a second AC–DC converter having a different characteristic sensitivity to the distortion components than the first converter. The outputs of the two converters are scaled and then summed, the scaling factors being dependent on the harmonics the effect of which is intended to be reduced. One converter is an average-sensing device, the other being a peak-To-peak or peak-averaging sensing device.

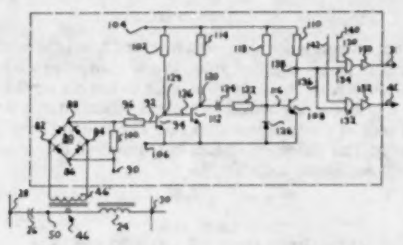


3,641,421

COMMUTATION CONTROL FOR INVERTER CIRCUITS

Carlton Eugene Graf; Einar Aasen Skogsholm, both of Erie, and Werner Karl Volkmann, Fairview, all of Pa., assignors to General Electric Company

Filed Feb. 24, 1971, Ser. No. 118,402
Int. Cl. H02m 7/52
U.S. Cl. 321—12 14 Claims



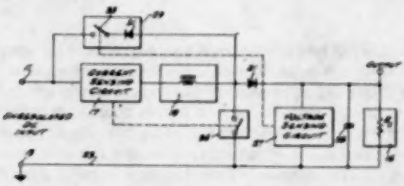
An inverter circuit utilizing gate controlled rectifiers for changing direct-current electric power to alternating-current electric power is provided with commutation control apparatus for sensing commutation current during the commutation of a first load rectifier and firing, or turning "on," another load rectifier in response thereto at a predetermined level of commutation current.

3,641,422

WIDE BAND BOOST REGULATOR POWER SUPPLY

Robert P. Farnsworth, 12612 Indianapolis, Los Angeles, Calif., and Dennis G. McCaughey, 1244 Saltair Ave., Los Angeles, Calif.

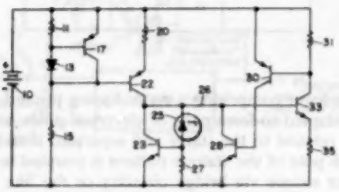
Continuation-in-part of application Ser. No. 884,858, Dec. 15, 1969, now abandoned. This application Oct. 1, 1970, Ser. No. 77,168
Int. Cl. G05f 1/56, 1/60
U.S. Cl. 323—8 12 Claims



A power supply which, in one embodiment, provides to a load a relatively constant DC (direct current) output voltage

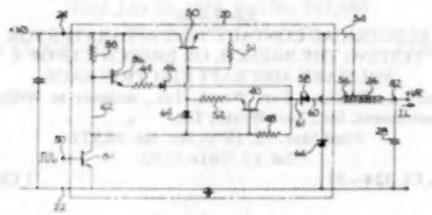
at a voltage level equal to or greater than that being supplied from a variable DC voltage source. The power supply includes a first switching circuit controlled by a voltage sensing circuit to allow energy to be transferred from a current storage device to a voltage storage device to maintain the amplitude of the output voltage within predetermined levels, and also includes a second switching circuit controlled by a current sensing circuit to allow the amplitude of circuit to be maintained within predetermined limits.

3,641,423
LOW-DROP VOLTAGE REGULATOR
Reuben Laverne Stauffer, Timonium, Md., assignor to The Bendix Corporation
Filed Nov. 16, 1970, Ser. No. 89,726
Int. Cl. G05f 3/14
U.S. Cl. 323—9 9 Claims



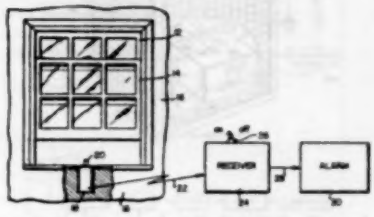
A follower amplifier which connects a variable and noisy power source to a load obtains its reference from a divider composed of two serially connected transistors using feedback to obtain two widely different ratios of dynamic resistance to average resistance.

3,641,424
REGENERATIVE VOLTAGE REGULATORS
James H. Kuykendall, Northridge, Calif., assignor to TRW Inc., Los Angeles, Calif.
Filed Nov. 20, 1970, Ser. No. 91,336
Int. Cl. G05f 1/56
U.S. Cl. 323—17 6 Claims



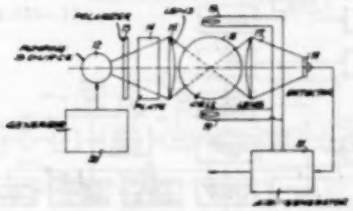
Regenerative power switches for use in semiconductor circuits such as in voltage regulators having a DC or low-frequency output controlled by a high-frequency pulse input. The circuits are designed to minimize the power dissipation in the regulator circuit and to minimize the number of components, particularly inductive components required. The regulator circuit having a negative common uses a feedback voltage from a secondary coil on the output filter choke to create a voltage exceeding the supply voltage, which is used without rectification thereof to force a series transistor into saturation during the ON portion of the cycle, thereby minimizing the voltage drop across that transistor and maximizing power output capability of the voltage regulator or amplifier. The regulator circuit having a positive common uses a feedback voltage from a top on the output filter choke winding to force a series transistor into saturation. The use of the tap minimizes the power dissipation in the regulator during the ON portion of the cycle and further aids in a fast and complete turnoff.

3,641,425
ALARM SYSTEM
Joel L. Cutler, and Joel I. Glickman, both of Huntingdon Valley, Pa., assignors to Transalarm Electronics Inc., Huntingdon Valley, Pa.
Filed Aug. 7, 1969, Ser. No. 848,258
Int. Cl. G08b 1/08
U.S. Cl. 340—224 7 Claims



A window-mounted alarm-actuating unit comprises a transmitter for generating wireless signals, a power source connected to the transmitter, means for mounting the transmitter and the power source in a window frame, and switch means operable upon the opening of the window in normal operation for actuating the transmitter to generate a wireless signal for a relatively short period whereby the transmitter draws power from the power source only during the relatively short period.

3,641,426
OPTICAL PUMPING MAGNETOMETERS
Henri Brun, and Jean-Louis Meilleroux, both of Paris, France, assignors to Thomson-CSF
Filed Feb. 25, 1970, Ser. No. 13,967
Claims priority, application France, Mar. 6, 1969, 6906239
Int. Cl. G01r 33/08
U.S. Cl. 324—0.5 R 5 Claims



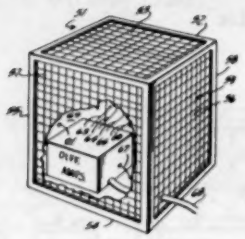
The invention relates to optical pumping magnetometers wherein an absorption cell is optically pumped with a pumping light source emitting two spectrum lines building up a doublet. The magnetometer according to the invention uses an absorption cell filed with a mixture of an alkali vapor and a buffer gas. The efficiency of the optical pumping is increased by insertion between the pumping source and the cell of an optical arrangement capable of circularly polarizing in mutually opposite directions the pumping radiations corresponding to the above-mentioned spectrum lines.

3,641,427

ELECTRIC FIELD SENSOR

Ed P. Pittman, and Roy A. Stanford, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 24, 1969, Ser. No. 862,642
Int. Cl. H04b *13/02*
U.S. Cl. 324—9 15 Claims



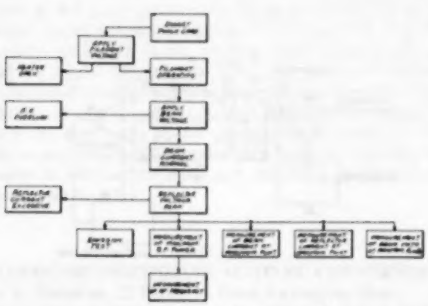
The invention is a method and means for sensing and measuring an electric field within sea water or any other environmental medium. It contains three pairs of diametrically opposed electric current sensing electrodes that are combined and configured in such manner as to form opposite faces of a cube. Each electrode is segmented to effect a predetermined mosaic pattern; and between each pair thereof, a differential amplifier, having an input impedance that is substantially equal to the operational environmental medium, is connected. A signal-processing system, including a telemetering link, a computer, and/or a readout, is connected to the outputs of the differential amplifiers.

3,641,428

KLYSTRON AUTOMATIC TUBE TESTER

Louis Mandel, Levittown, N.Y., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 21, 1969, Ser. No. 878,737
Int. Cl. G01r *31/22*
U.S. Cl. 324—24 3 Claims



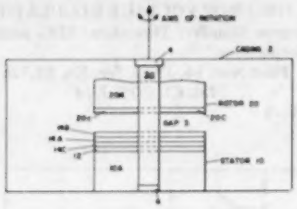
The apparatus is a device for testing klystron tubes and consists of filament control and regulator means, filament continuity and emission test means, reflector logic and control means, beam voltage programming and control means, RF power and frequency-determining means and indicator means for applying voltages to the filament and other electrodes of integral cavity klystron tubes in a predetermined sequence whereby the static and dynamic operating characteristics of the tubes can be tested.

3,641,429

POSITION-MEASURING TRANSDUCER COMPRISING A STATOR AND RELATIVELY MOVABLE FLUX-ALTERING MEMBER

Duncan B. Cox, Jr., Manchester, and Kenneth Fertig, Brookline, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 24, 1969, Ser. No. 887,896
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 PS 20 Claims



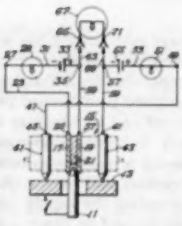
A transducer comprising a stator having printed thereon a pattern adapted to form pairs of electrical poles, and a rotor movable relative to the stator and separated therefrom by a gap. Each pole of the stator's pattern is coupled to an external power source via bridge circuitry or the like such that upon the application of power a magnetic field exhibiting flux is generated, inducing a voltage proportional thereto in each pole. The rotor's surface adjacent to and opposite the stator's pole pairs is coated with two types of oppositely acting flux-altering material. MOvement of the rotor relative to the stator positions the flux-altering material on the rotor's surface relative to the stator's pole patterns, thereby altering the flux of the magnetic field about each pole, which is equivalent to altering the impedance of each pole pattern. The resulting difference in flux-induced voltage between those poles whose flux is altered in one way and those poles of oppositely altered flux, as measured by the bridge circuitry, is a measure of the mechanical displacement of the rotor with respect to the stator. The transducer may be configured to measure either angular or linear displacement and is operable either as a single-speed and/or multispeed device.

3,641,430

ELECTRICAL CONTACT TEST APPARATUS FOR TESTING THE BREECH, OR BREECH CAP OF A MILITARY AIRCRAFT EJECTION RACK

Robert A. Williams, Fort Worth, Tex., assignor to Williams Instrument, Inc., Fort Worth, Tex.

Filed Mar. 12, 1970, Ser. No. 18,971
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 1 Claim



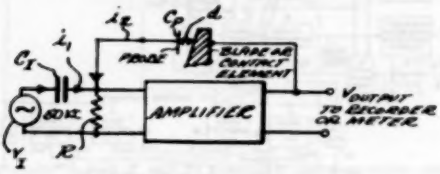
Test apparatus especially suitable for testing the breech or breech cap used with ejection racks in military aircraft and including one pair of contacts for engaging the inner contact of the breech or breech cap and connected in a series with a power source and an indicator. A second set of contacts engages an outer contact and a breech or breech cap and is also

connected in series with a power source and an indicator. A third indicator is connected in a series across one of the inner contacts and one of the outer contacts of the breech or breech cap. As a consequence, the electrical conductivity of the surfaces of inner and outer contacts of the breech or breech cap may be determined, as well as stray voltage across the inner and outer contacts.

3,641,431
METHOD FOR INSPECTING AND ADJUSTING CUTTER BLADES

Robert F. Pigage, Rochester; Arthur B. Ryan, Victor, and Robert E. Smith, Rochester, all of N.Y., assignors to The Gleason Works, Rochester, N.Y.

Filed Oct. 1, 1968, Ser. No. 764,223
Int. Cl. G01n 27/26
U.S. Cl. 324—61 R **2 Claims**

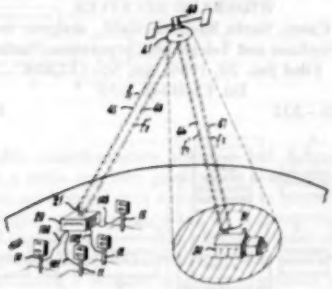


A cutter inspection device and a method of operating the device for determining cutter blade settings by measuring an air gap is disclosed. The device comprises an electronic measuring unit, with a capacitance probe that measures an air gap having a value dependent upon a blade setting. The air gap is formed between the capacitance probe and the cutter blade for some blade setting measurements and in other blade setting measurements, the air gap is formed between the capacitance probe and a contact element in contact with a surface or edge of a cutter blade.

3,641,432
RADIO POSTAL SYSTEM ACKNOWLEDGEMENT APPARATUS

Donald S. Bond, Princeton, N.J., assignor to RCA Corporation

Filed July 26, 1968, Ser. No. 747,950
Int. Cl. H04b 1/50, 7/20
U.S. Cl. 325—4 **5 Claims**

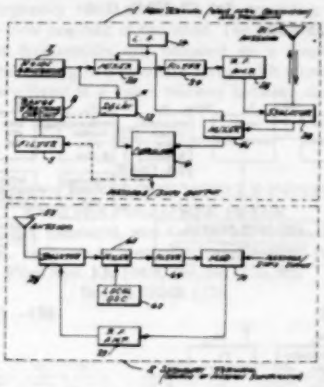


Acknowledgement apparatus for use in a radio postal system of the type employing an orbiting relay satellite for transmission, including receiver reply circuits operating at a narrower bandwidth and with a lower signal-to-noise ratio than are associated with corresponding transmitter message circuits so as to enable use of reply circuits of substantially reduced power.

3,641,433
TRANSMITTED REFERENCE SYNCHRONIZATION SYSTEM

Ralph W. Mifflin; Joseph P. Wheeler, both of Rome, and Joseph T. Massoud, Washington Mills, all of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force

Filed June 9, 1969, Ser. No. 831,479
Int. Cl. H04b 1/59
U.S. Cl. 325—8 **2 Claims**

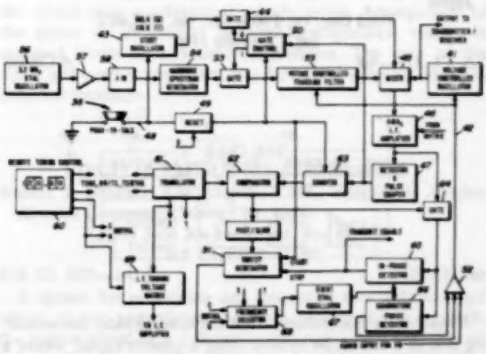


A transmitted reference synchronization system which combines a high process gain transmitted reference communication link with a fixed time delay automatic synchronization technique to allow a correlation process to be accomplished at the origination end of the link with extremely accurate and completely automatic synchronization.

3,641,434
WIDE-BAND CRYSTAL-CONTROLLED TRANSCEIVER WITH REMOTE DIGITAL TUNING

Lester R. Yates, Lighthouse Point, Fla.; Charles M. Dorsey, Jr., Baltimore; John B. Howell, Sparks; Winfred S. Conklin, Baltimore, all of Md.; Joseph J. Sawicki; Reeves T. Shepherd, both of Pompano Beach, Fla., and Silvio Soares, Baltimore, Md., assignors to The Bendix Corporation

Filed Oct. 10, 1968, Ser. No. 766,435
Int. Cl. H04b 1/40, 3/08
U.S. Cl. 325—17 **8 Claims**



A wide-band VHF crystal-stabilized transceiver remotely controlled by digital logic means. The transceiver incorporates a frequency synthesizer having a spectrum generator

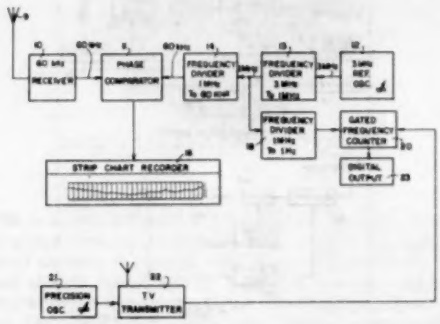
and a variable frequency oscillator phase locked to a selected component of the spectrum generator output. The particular component to which the oscillator is locked is selected by the digital logic which includes a translator for the ARINC 2×5 code enabling the use of decimal control switches.

3,641,435

TELEVISION FREQUENCY STABILIZING SYSTEM

Robert J. Munn, Arlington Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 7, 1969, Ser. No. 848,246
Int. Cl. H04b 1/16
U.S. Cl. 325—63 4 Claims



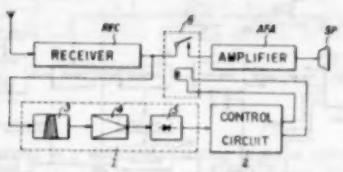
A very low-frequency receiver is tuned to a station transmitting a low-frequency standard signal, and this received signal is compared in a phase comparator with a signal divided down from a high-frequency precision reference oscillator at a transmitting station which is to be operated at a predetermined carrier frequency. The output of the precision reference oscillator also controls a gated frequency counter, the input signals to which are obtained from the local oscillator used to provide the carrier at the transmitting station. The frequency counter then provides an indication of the frequency of the transmitted carrier accurately referenced to the received low-frequency standard signal whenever the precision reference oscillator frequency is properly adjusted to produce a nonvarying output from the phase comparator.

3,641,436

BROADCAST SYSTEM FOR A CONTROL SIGNAL WITH INTERFERENCE REDUCTION

Masayuki Fukata, 94, Shimorenjaku, Metaka-shi, Tokyo, Japan

Filed Dec. 16, 1969, Ser. No. 885,402
Int. Cl. H04b 1/06
U.S. Cl. 325—64 4 Claims



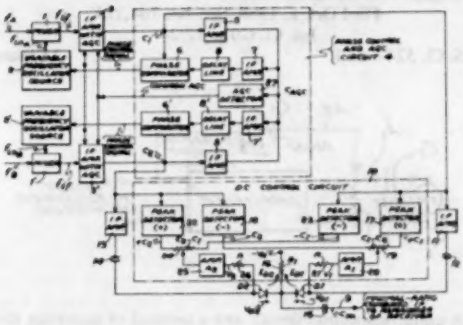
A system for controlling, from the sending side, the receiving side in a broadcast system using a control signal, where a false signal similar to the regular control signal is detected from the broadcast signals before the receiving side is spuriously triggered by the false signal. Elimination filter or filters is/are inserted in the path of the broadcast signals during only a predetermined time to eliminate the same frequency components as the control signal, whereby the control signal can be transmitted with no chance of spurious triggering.

3,641,437

MAXIMAL-RATIO DIVERSITY RECEIVING SYSTEM

Richard J. Gurak, Summit, and Milton D. Reicher, Parkridge, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 14, 1970, Ser. No. 70,624
Int. Cl. H04b 1/06
U.S. Cl. 325—305 10 Claims



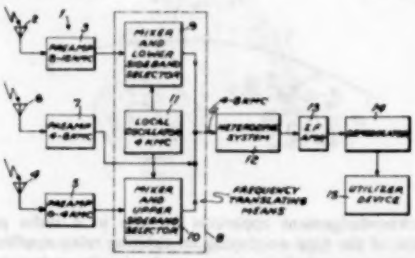
n RF diversity signals are routed to separate channels and heterodyned to *n* IF signals having the same IF frequency. The IF signals are linearly combined to provide a common IF signal from which an AGC signal is generated and is used to control the gain of each IF signal produced to assure a constant amplitude, common IF signal. This common IF signal is also used as a reference signal for a phase comparator in each channel. Each phase comparator compares the phase of its associated IF signal to the reference signal and adjusts its associated IF signal to be inphase with the other IF signals. A variable impedance diode is coupled to be responsive to each IF signal. The impedance of each diode is controlled by comparing the amplitude of the associated IF signal to the remaining $(n-1)$ IF signals. The IF signal output of each diode is combined to provide a maximal-ratio combined IF signal for utilization in the remainder of the receiver.

3,641,438

WIDEBAND RECEIVER

Eugene T. Canty, Santa Barbara, Calif., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 20, 1966, Ser. No. 522,808
Int. Cl. H04b 1/36
U.S. Cl. 325—332 10 Claims



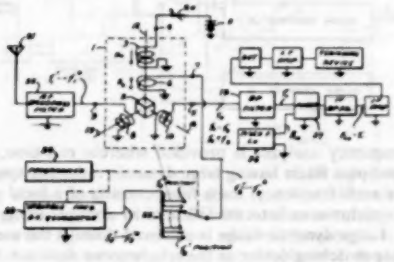
A plurality of preamplifiers divide a wideband frequency range into a plurality of different, contiguous frequency regions. A frequency translator is coupled to the preamplifiers

to translate the frequency regions to the frequency region of one of the preamplifiers. An arrangement is coupled to the frequency translator to recover intelligence, or to determine the frequency of the signal, contained in the wideband frequency range.

3,641,439
NEAR-FIELD RADIATION MONITOR
Edward E. Aslan, Plainview, N.Y., assignor to The Narda Microwave Corporation, Plainview, N.Y.
Filed Aug. 8, 1969, Ser. No. 848,620
Int. Cl. H04b *1/06;* **G01r** *5/22*
U.S. Cl. 325—363 **12 Claims**

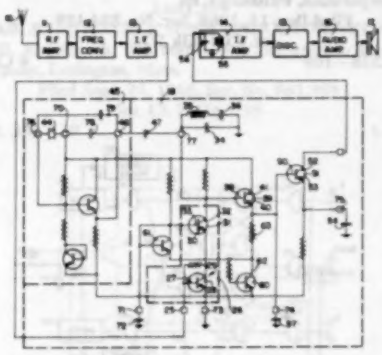
A probe having a pair of thin film thermocouples positioned in quadrature functions as both an antenna and detector. The thermocouple elements develop a voltage commensurate with the radiofrequency power of the impinging field and this voltage is then used to drive a meter element and display a quantity directly readable as radiofrequency power.

3,641,440
PROGRAMMED PARAMAGNETIC TUNING RADIO RECEIVER USING LARMOR RESONANCE
Henry J. Bush, Rome, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force
Filed Oct. 15, 1970, Ser. No. 81,030
Int. Cl. H03j *13/00*
U.S. Cl. 325—383 **7 Claims**



A tunable radiofrequency selector and frequency converter for a radio receiver, particularly a receiver for radio signals that are hopped over a wide band in accordance with a prearranged code or program as a protection against jamming. The device derives its selectivity from the narrow band magnetic resonances associated with atomic particles. A cell containing a suitable magnetic resonance material is subjected to an amplitude modulated magnetic field which results in a frequency modulation of the Larmor resonance of the cell. The frequency modulation gives rise to sideband resonances which are restricted to first order resonances by limiting the modulation index and which may be moved over the reception band by varying the modulating frequency of the magnetic field. When a sideband resonance coincides with the frequency of a received signal in the input circuit of the device all sideband resonances are excited as well as the Larmor resonance corresponding to the steady component of the magnetic field, and energies at these frequencies are coupled into the output circuit of the device. The output circuit contains a band-pass filter passing energy in a narrow band centered on the Larmor frequency but rejecting the sideband energies. Therefore, the output of the device for all received signals lies in a narrow band centered on the Larmor frequency. The field modulating frequency is programmed to shift one of the sideband resonances in synchronism with the frequency hopping program of the transmitter. Wide transmission bands are covered by two magnetic resonance cells, one having its Larmor resonance above and the other below the radiofrequency band and each cell providing sideband sensitivities over one-half of the band. The resulting two Larmor output frequencies are reduced to a single output frequency by beating in a common mixer with a local oscillator frequency fixed at a value midway between the Larmor frequencies.

3,641,441
FREQUENCY CONVERSION MODULE INCLUDING EMITTER FOLLOWER MIXER
David L. Gunn, Lombard, and George M. Hanus, Norridge, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.
Filed Nov. 13, 1969, Ser. No. 876,303
Int. Cl. H04b *1/26*
U.S. Cl. 325—430 **18 Claims**

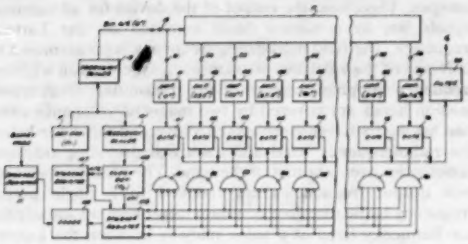


A frequency conversion circuit for a frequency-modulated receiver adapted to be manufactured in integrated circuit form. The circuit includes an oscillator of the Colpitts type, a mixer arranged in an emitter follower configuration, and input and output amplifiers. A feedback circuit coupled between the input amplifier and mixer allows operation of the circuit over a substantial voltage range. Arrangement of the mixer in an emitter follower configuration results in reduced levels of undesired frequencies. The gain of the input and output amplifiers may be varied allowing usage in different products.

3,641,442
DIGITAL FREQUENCY SYNTHESIZER
Robert J. Boucher, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed June 25, 1970, Ser. No. 49,688
Int. Cl. H03b *19/00*
U.S. Cl. 307—14 **23 Claims**

A system for generating any frequency in a desired band where, in one embodiment, a phase shifting circuit converts the output signal of a reference oscillator into a plurality of incremental phase shifts which are respectively applied to a plurality of gating circuits. In response to a multibit binary word, adder and register circuits combine to add the multibit binary word to itself at each occurrence of clock pulses and

apply the four most significant bits of the sum therefrom to each of the plurality of gating circuits in order to selectively



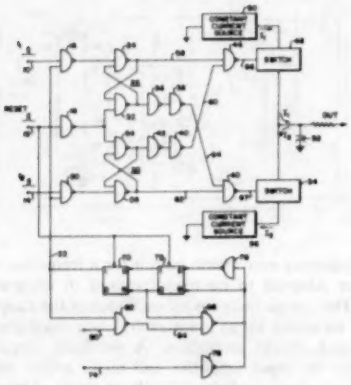
control the operation of the plurality of gating circuits to produce an output signal whose frequency is a function of the amplitude of the multibit binary word.

3,641,443

FREQUENCY COMPENSATED PULSE TIME DISCRIMINATOR

John C. Zerby, Houston, Tex., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 11, 1969, Ser. No. 884,159
Int. Cl. H03k *5/20*
U.S. Cl. 328—109 **4 Claims**



A pulse time discriminator for radar applications and the like adapted to measure the time or phase difference between pulses in two trains of pulses by the use of flip-flop and NAND circuit components only, and incorporating means for maintaining the transfer function and offset current of the discriminator substantially constant.

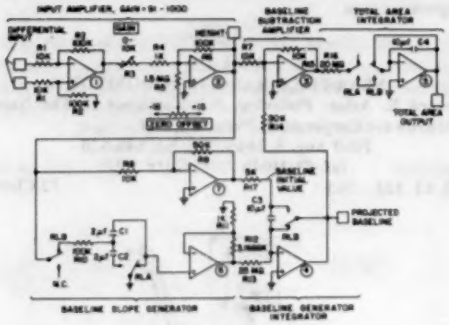
3,641,444

BASELINE COMPENSATING INTEGRATOR

Geoffrey P. Watts, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 1, 1970, Ser. No. 68,712
Int. Cl. G06g *7/18*
U.S. Cl. 328—127 **1 Claim**

A device to compensate for predictable variations from a baseline. A circuit stores information sufficient to predict the variation from the baseline and this variation is later subtracted from the total signal by a difference amplifier. A total



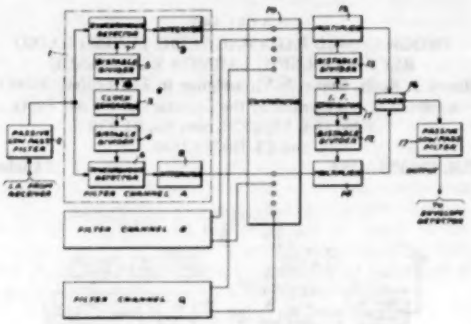
area integrator may be used with the device to provide additional information.

3,641,445

FREQUENCY ANALYZER

Joseph A. Green, Adelphi, Md., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed July 23, 1970, Ser. No. 57,658
Int. Cl. H03b *3/04*
U.S. Cl. 328—140 **6 Claims**



A frequency analyzer is provided wherein real-time, narrow band-pass filters having large dynamic range are synthesized for each frequency. Each filter consists of a local clock driven synchronous detector followed by a simple integrating circuit. Large dynamic range is achieved through the use of a two-state switching device as the synchronous detector. Since the output of the synchronous detector depends on the phase relationship between the input signal and the local clock, two phase-quadrature filters are provided for each frequency. The output from the filter pair is processed in a manner that yields a signal whose amplitude is independent of the input signal-local clock phase relationship.

3,641,446

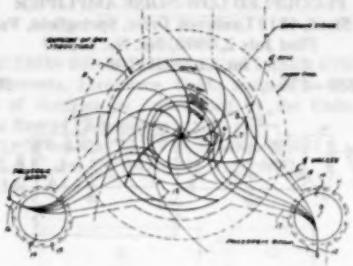
POLYERGIC CYCLOTRON

Hayden S. Gordon, Berkeley, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 18, 1969, Ser. No. 886,237
Int. Cl. H05h *13/00*
U.S. Cl. 328—228 **3 Claims**

A device for the production of a multiple energy proton beam comprising a negative hydrogen ion cyclotron with

stripping foils placed at different radial and azimuthal positions. The negatively charged hydrogen ions at the various energy levels represented by the radial positions of the foils are stripped of their electrons thereby becoming protons which reverse their direction of curvature because of the



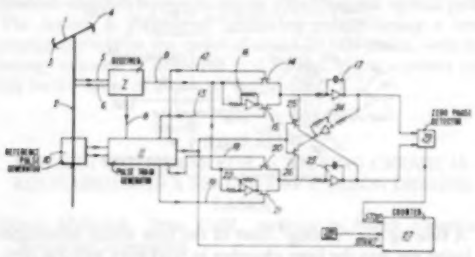
reversed polarity and exit from the cyclotron along paths that, with proper azimuthal positioning of the foils, meet at a single point outside the cyclotron. A circular combining magnet centered on this point bends the proton trajectories as required to continue along a common path thus creating the multiple energy or polyergic beam.

3,641,447

PHASE SHIFT DETECTOR

Brian R. Gaines, Colchester, and Raymond A. Shemer, Harlow, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 25, 1970, Ser. No. 14,423
Claims priority, application Great Britain, Mar. 19, 1969, 14,389/69
Int. Cl. H03d 3/04
U.S. Cl. 329—126 1 Claim



An apparatus for measuring the phase of an input signal utilizing cross-correlation techniques. In a first channel, the input signal is digitally compared with a reference pulse train having a pulse density distribution which approximates a sign wave and is then integrated. In a second channel, the input signal is digitally compared with a pulse train signal whose pulse density distribution approximates a cosine wave and is then integrated. The first and second channel integrators are cross coupled to form a harmonic oscillator. A digital counter provides a measure of the time elapsed before the oscillator signal reaches a zero phase. This measurement is proportional to the phase of the original input signal.

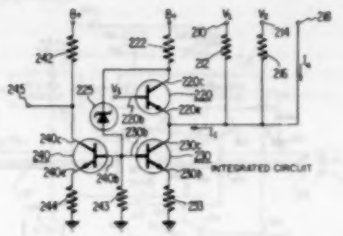
3,641,448

TRANSISTOR SIGNAL TRANSLATING STAGE

Steven Alan Steckler, Clark, N.J., assignor to RCA Corporation

Filed Oct. 1, 1969, Ser. No. 862,759
Int. Cl. H03f 3/42
U.S. Cl. 330—18 17 Claims

A signal translating circuit includes a constant current transistor, a variable conduction transistor having a signal input terminal, and a feedback loop coupling the transistors. The collector-emitter paths of the transistors are connected in series across a voltage source. An output transistor is electrically and thermally coupled to the variable conduction transistor to provide an output current which is proportional to and at a predetermined phase relationship with the input



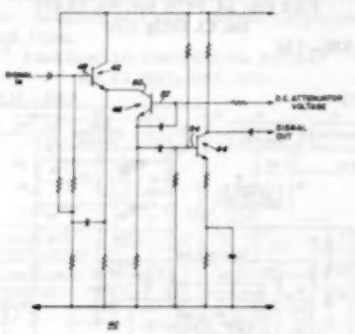
current. The circuit is characterized by having both a low impedance current input, and a high impedance voltage input. The direct voltage level of the input can be selected for suitable biasing of the preceding stage. The circuit can be employed, for example, as a current sampler, a linear amplifier, a Q-multiplier, or a signal-matrixing circuit.

3,641,449

VARIABLE IMPEDANCE SEMICONDUCTOR NETWORK

Bjorn H. Engelhardt, Barrington, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 29, 1969, Ser. No. 861,955
Int. Cl. H03g 3/30
U.S. Cl. 330—29 1 Claim



A transistor circuit in which the transistor as the nonlinear gain element has its AC gain destroyed through the use of an emitter to base capacitance thus making the transistor into a DC voltage divider. This permits operating the transistor in a substantially linear region along a DC resistive load line. Consequently, large magnitude AC signals coupled to the collector are resistively divided down by a voltage divider taken to be the transistor and a series resistor.

3,641,450

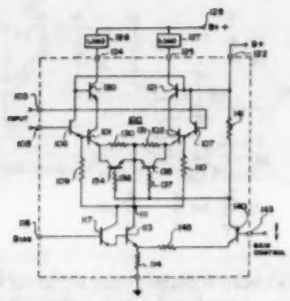
GAIN CONTROLLED DIFFERENTIAL AMPLIFIER CIRCUIT

Gerald K. Lunn, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 15, 1970, Ser. No. 98,279
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D 11 Claims

A two-stage monolithic differential amplifier circuit employs electronic gain control of both of the stages in order to

improve the signal-to-noise ratio of the circuit and to reduce signal distortion and cross-modulation at high-signal levels. The input differential stage operates with current-division gain control. The output signals of the input stage are applied to the second or output differential amplifier stage, in which the transistors each have emitter resistors connected to a



common terminal. The emitter resistors each are shunted by the collector-emitter path of a shunt transistor which is rendered nonconductive for maximum gain reduction of the output stage and which is saturated for minimum gain reduction of the output stage. The DC level of the output stage is maintained substantially constant throughout the AC gain control range.

3,641,451

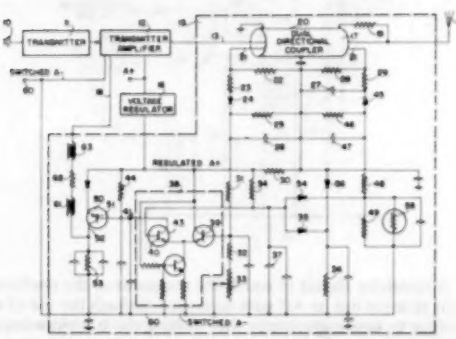
AMPLIFIER PROTECTION CIRCUIT

Gale C. Hollingsworth, and Ronald V. Steffel, both of Addison, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 24, 1970, Ser. No. 13,475

Int. Cl. H03g *3/30*

U.S. Cl. 330—134 **13 Claims**



A protection circuit for a transmitter amplifier is provided which senses the forward power level and develops a first voltage which is compared with a reference voltage to provide a control voltage which controls the power developed by the transmitter amplifier. Increase in the forward power level is detected changing the control voltage to cause a reduction in the forward power developed by the transmitter amplifier. Decrease in forward power level is detected changing the control voltage to cause an increase in forward power developed by the transmitter amplifier. Reflected power is sensed developing a second voltage which causes a reduction in reference voltage when reflected power exceeds a predetermined level. Reduction of the reference voltage also changes the control voltage to reduce the forward power of the transmitter amplifier to a safe level. An increase in transmitter amplifier temperature beyond a predetermined level is sensed causing a reduction in the reference voltage to change the control voltage thereby reducing the power of the transmitter amplifier to a safe level.

3,641,452

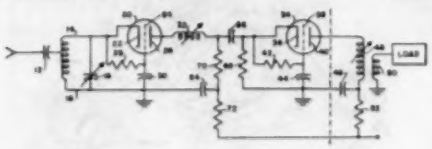
PI-COUPLED LOW-NOISE AMPLIFIER

Willie L. Steed, 6812 Lynbrook Drive, Springfield, Va.

Filed July 2, 1970, Ser. No. 51,927

Int. Cl. H03l *1/00*

U.S. Cl. 330—176 **10 Claims**



Two stages of a series cascade amplifier are coupled by a Pi network. The amplifier stages may be grounded grid in the case of vacuum tube or grounded gate where the stages are field effect transistors. The Pi network coupling, cooperating with the stages in a stable grounded grid or grounded gate configurations allows the impedance of the Pi network to be adjusted for lowest noise with immunity from oscillation.

3,641,453

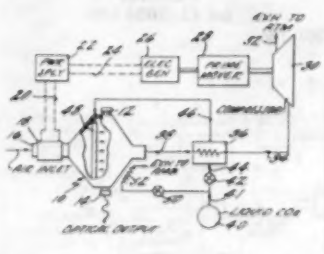
MODIFIED OPEN CYCLE GAS LASER SYSTEM

Frank R. Biancardi, Vernon, Conn., and Gorken Melikian, Springfield, Mass., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 10, 1969, Ser. No. 857,640

Int. Cl. H01s *3/04, 3/22, 3/09*

U.S. Cl. 331—94.5 **5 Claims**



A flowing gas "mixing" laser of the type which introduces a lasing gas into the laser chamber in proximity with the optical cavity, and provides excited energizing gas to the laser chamber separately, uses the cooling capacity of the liquefied lasing gas to improve the overall operation of the system. In one embodiment, the source of liquefied lasing gas is utilized as a coolant in a heat exchanger connected between the gas laser outflow and the inlet to the compressor used to cause gaseous flow through the laser. The compressor inlet temperature is reduced, thus permitting an increase in the capacity of the compressor and a reduction in the power of the prime mover which operates the compressor. In one variation of this embodiment, the lasing gas, from a liquefied source thereof is passed through the compressor inlet gas heat exchanger and is also utilized to cool the jacket of the laser chamber. In another variation of this embodiment, the lasing gas that is utilized as a coolant in a heat exchanger is vented to atmosphere, and the source of liquefied lasing gas also supplies the laser independently of the heat exchanger. In still another variation of this embodiment, a water cooled heat exchanger is used to precool the laser effluent before passing through the laser gas cooled heat exchanger. In another embodiment of the invention, the source of liquefied lasing gas is introduced in proximity with the laser chamber as a lasing gas and is separately used in heat exchangers to

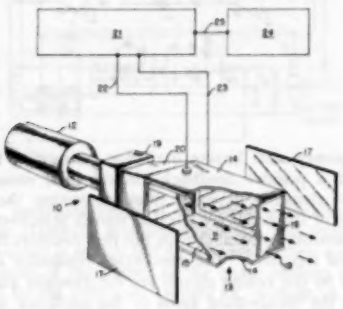
cool the inlet air and the gases leaving the laser chamber, and then vented to ambient. In each embodiment, the outflow of the compressor is vented to ambient, and the prime mover also powers an electric generator to operate a power supply that produces high-voltage DC current for a DC electric discharge plasma excitation means.

3,641,454

ELECTRON BEAM-PUMPED GAS LASER SYSTEM

Barton Krawetz, Livermore, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed May 25, 1970, Ser. No. 40,037
Int. Cl. H01s 3/02, 3/22, 3/09
U.S. Cl. 331—94.5 7 Claims



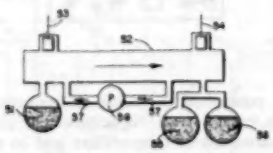
A high-power electron beam-initiated electrical-discharge gas laser system including a gaseous lasing medium placed in an optical cavity contained in a vessel having two large electrodes electrically insulated from each other; and a charged particle accelerator directing an electron beam through the gaseous medium perpendicular or parallel to the optical path. The system is capable of producing pulses having a total energy content on the order of about 20,000 joules, with the energy released or delivered in 0.5 μsec., giving a power rating on the order of about 10^4 megawatts.

3,641,455

METHOD AND MEANS FOR ACHIEVING CHEMICAL EQUILIBRIUM IN A SEALED-OFF CARBON DIOXIDE LASER

Edwin Matovich, Brea, Calif., assignor to North American Rockwell Corporation

Original application Mar. 13, 1968, Ser. No. 712,831. Divided and this application July 13, 1970, Ser. No. 54,296
Int. Cl. H01s 3/22
U.S. Cl. 331—94.5 5 Claims



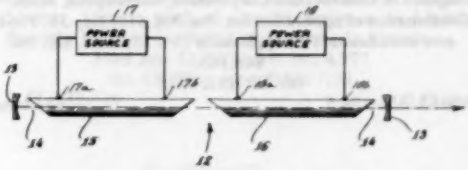
Chemical equilibrium and optimum operation in a sealed-off CO_2 gas laser is maintained by replenishing the CO_2 lost by dissociation into CO and O_2 either directly by providing a source and getter arrangement inside the laser tube or by replenishing the O_2 lost by reaction with oxygen gettering surfaces in the laser cavity by placing an oxygen yielding compound in the laser cavity which will react with the CO to product CO_2.

3,641,456

METHOD AND APPARATUS FOR PRODUCING HIGH-POWER SINGLE-FREQUENCY RADIATION

Paul H. Lee, Goleta, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 14, 1969, Ser. No. 807,245
Int. Cl. H01s 3/10, 3/22
U.S. Cl. 331—94.5 7 Claims



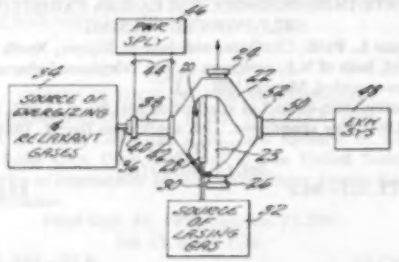
A high-power single-frequency laser including a gain cell and an absorption cell having an absorption band corresponding to the gain band of the gain cell. Both cells are mounted within a resonant optical cavity. The absorption capacity of the absorption cell is less than the gain capacity of the gain cell but is sufficiently large so that the net self-saturation effect of an oscillatory mode within the cavity is less than the cross-saturation effect of the same oscillatory mode on other modes and, as a result, the reduction in gain at the frequency of an oscillating mode is less than the gain reduction caused by that mode at other frequencies. Tuning of the single frequency across the gain band of the laser is also a feature of this invention.

3,641,457

HIGH-PERFORMANCE GAS LASER

Clyde O. Brown, Newington, and Robert H. Bullis, Avon, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 10, 1969, Ser. No. 857,649
Int. Cl. H01s 3/05, 3/09
U.S. Cl. 331—94.5 45 Claims



Flowing gas laser systems of a variety of configurations, including exemplary CO_2—N_2He systems, are provided with a critical amount of relaxant gas, determined by maximum differential between the upper and lower laser levels of the lasing gas for a given rate of excitation of the upper laser level, a mass flow suitably high to convect the heat away from the optical gain region causing the temperature of the optical gain region to be maintained suitably low that the equilibrium population of an upper energy state of a limiting self-relaxation process between the lower laser level and ground is maintained less than the significant fraction of the total lasing gas population. Increased mass flow, resulting partially from increased pressure, provides increased losses within the electric field region where the upper laser level is excited through electron collisions, the increased losses permitting operation with a higher electric field, with higher

electron densities, and with increased pressure, thereby permitting operation at an optimum ratio between electric field to neutral particle density with a higher electric field.

3,641,458

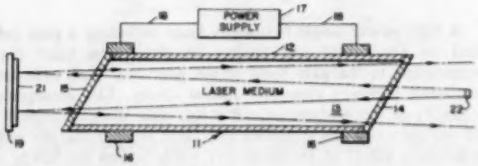
MODE SELECTIVE LASER WITH SMALL FEEDBACK REFLECTOR AND DIFFRACTION COUPLED OUTPUT

James T. La Tourrette, Huntington; Maurice C. Newstein, Syosset, and Paul J. Rabinowitz, Plainview, all of N.Y., assignors to Control Data Corporation, Minneapolis, Minn.

Continuation of application Ser. No. 386,619, July 31, 1964, now abandoned. This application Oct. 13, 1969, Ser. No. 866,165

Int. Cl. H01r *3/05*

U.S. Cl. 331—94.5 **12 Claims**



Laser apparatus is disclosed including a pair of reflectors for providing a regenerative feedback path through a laser working medium, one of the reflectors being substantially as large as the cross section of the working medium, and the other reflector being substantially smaller than the cross section of the working medium and sufficiently small to produce significant diffraction effects, the output of the apparatus being the portion of the laser beam not intercepted by the smaller reflector.

3,641,459

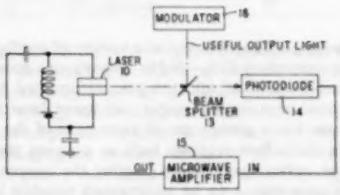
APPARATUS AND METHOD FOR NARROWING THE PULSE WIDTH AND STABILIZING THE REPETITION RATE IN SEMICONDUCTOR LASERS EXHIBITING SELF-INDUCED PULSING

Thomas L. Paoli, Chatham, and Jose E. Ripper, North Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of application Ser. No. 833,365, June 16, 1969, now abandoned. This application Dec. 1, 1969, Ser. No. 881,184

Int. Cl. H01s *3/18*

U.S. Cl. 331—94.5 **13 Claims**



The width of pulses in the output of a semiconductor laser exhibiting self-induced pulsing is narrowed and its repetition rate stabilized by applying to the laser a perturbation signal having a frequency that is related to the pulse repetition rate as the ratio of two integral numbers.

3,641,460

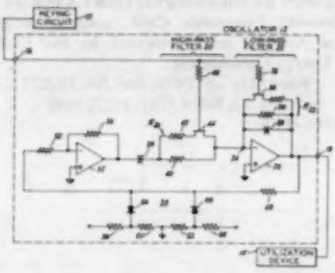
FREQUENCY SHIFT TRANSMITTER

Jerry L. Holsinger, Lexington, Mass., assignor to Intertel, Inc., Burlington, Mass.

Filed Nov. 9, 1970, Ser. No. 87,706

Int. Cl. H03b *5/26*

U.S. Cl. 331—110 **4 Claims**



A frequency shift keying oscillator comprising filter circuits and a positive feedback circuit. First resistors and reactance elements in each filter determine the natural frequency of the oscillator. Keying signals selectively switch second resistors in parallel with the first resistors to change the natural frequency. The percentage resistance variations produced by the keying signals are substantially equal. This equalizes the steady-state gains of the oscillator in its two modes so that no amplitude discontinuities occur in the output signal as the oscillator switches from one mode to the other. As the reactor in each filter is a constant value element, no phase discontinuities occur. Hence, the output signal is a continuous, fundamental sinusoidal signal which has two mutually exclusive frequencies.

3,641,461

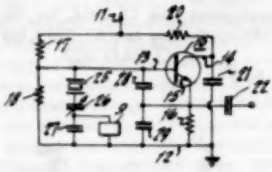
TEMPERATURE COMPENSATED CRYSTAL OSCILLATOR

Pawel K. Mrozek, Washington, Pa., assignor to RCA Corporation

Continuation-in-part of application Ser. No. 591,860, Nov. 3, 1966, now abandoned. This application Aug. 23, 1968, Ser. No. 755,521

Int. Cl. H03b *5/36*

U.S. Cl. 331—116 R **2 Claims**



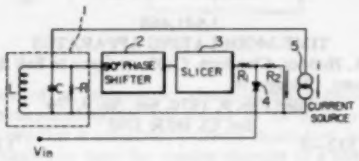
A crystal controlled oscillator is frequency sensitive to variations in crystal load capacitance in circuit with the crystal, to variations in temperature and to operation over extended periods of time. A variable capacitor is provided in circuit with the crystal so as to correct for the crystal frequency drifts due to changes in operation of the crystal over extended periods of time. A separate fixed capacitor is connected in series with the crystal and in circuit with the variable capacitor to provide part of the frequency determining circuit of the crystal oscillator. A temperature compensation network is coupled across the fixed capacitor and is responsive to temperature changes to provide a correct degree of load capacitance change in the circuit so that the

oscillator frequency is maintained within a given frequency tolerance regardless of the adjustment of the variable capacitor which is used to adjust the crystal for frequency drift.

3,641,462
L-C OSCILLATOR TUNABLE BY EXTERNAL DC VOLTAGE THROUGH PHASE SHIFTED FEEDBACK NETWORK

Noriaki Fujimura, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki-shi, Japan

Filed June 24, 1970, Ser. No. 49,295
Claims priority, application Japan, July 11, 1969, 44/55304
Int. Cl. H03b *5/12*
U.S. Cl. 331—117 R **7 Claims**



An L-C oscillator circuit is tunable as a function of the value of an externally applied DC voltage. The phase of the resonant circuit is shifted 90° by a phase shifting circuit and the amplitude of the output of the phase shifting circuit is controlled by the externally applied DC voltage. A current, the amplitude of which is proportional to the controlled output of the phase shifting circuit is generated by a current generator and fed back to the resonant circuit. As this current is shifted 90° out of phase, the capacitive element of the resonant circuit is controlled by controlling the output of the phase shifter by means of the applied DC voltage. A wave shaping circuit may be used to convert the output of the phase shifting circuit from a sinusoidal to a square wave.

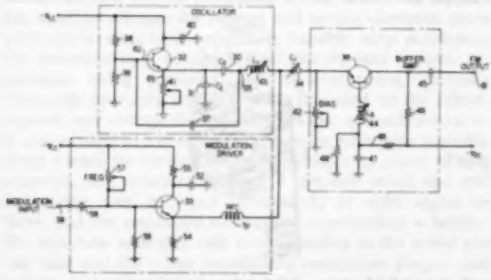
ERRATUM

For Class 332—9 see:
Patent No. 3,641,468

3,641,463
LINEARITY COMPENSATION FOR A VOLTAGE-CONTROLLED OSCILLATOR

Arthur Francis Perks, Howell Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 27, 1970, Ser. No. 40,938
Int. Cl. H03c *3/22*
U.S. Cl. 332—16 T **6 Claims**

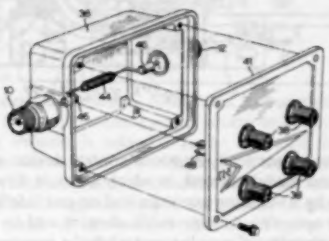


A circuit using a voltage-controlled oscillator with a hyperabrupt junction diode in the series resonant circuit is operated as a variable frequency modulation circuit. An amplifier with an inductor in the base circuit of a common base configuration is used to present an impedance with a frequency-dependent real part to the series resonant circuit of the oscillator. The nonlinearities in the characteristic of the hyperabrupt junction diode are compensated by the frequency-dependent real input impedance to achieve linear operation.

3,641,464
DIRECTIONAL COMMUNICATION SIGNAL TAP

David B. Crowhurst, Toronto, Ontario, and John E. Thomas, Lindsay, Ontario, both of Canada, assignors to Lindsay Specialty Products Limited, Lindsay, Ontario, Canada

Filed Jan. 22, 1970, Ser. No. 4,977
Int. Cl. H01p *5/14;* **H03h** *7/38*
U.S. Cl. 333—10 **5 Claims**

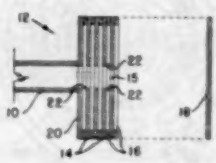


This invention relates to a directive tap for tapping off a portion of a signal strength such as a television signal from a main cable transmission line. The tap of the invention has an improved directivity over a substantial bandwidth which is achieved by providing an electrostatic shield between the input and output levels of the tap on a tap circuit that has a directivity of at least 15 decibels over a range of at least 150 megahertz. The improved directivity is preferably achieved by constructional features of the current and voltage sensing transformers of the unit which includes a winding hole in the core of at least one-hundred-twenty-five thousandths of an inch to provide extra spacing for the windings and the use of a single turn winding on each core that is tightly pulled through the core to accurately and predictably locate the winding with respect to the core.

3,641,465
COMPACT HIGH-POWER BROADBAND RADIOFREQUENCY LOAD TERMINATION

Vernon G. Price, Los Altos, Calif., and Richard W. Grow, Salt Lake City, Utah, assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 15, 1970, Ser. No. 72,295
Int. Cl. H01p *1/26*
U.S. Cl. 333—22 R **10 Claims**



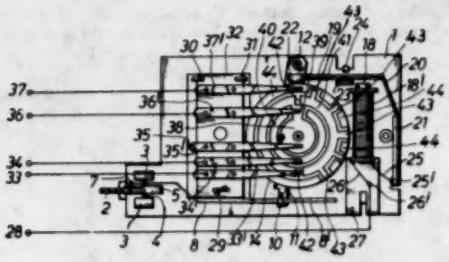
A load termination for absorbing a broad range of radiofrequency energy and comprised of a large number of aligned chambers formed by closely spaced plates that are coated with a lossy material and are spaced apart a distance that is substantially less than the spacing required for the chambers to resonate at the highest frequency of the range.

3,641,466

ELECTROMAGNETIC CONTROL, ESPECIALLY FOR CROSSING GATES OF TOY AND MODEL RAILROADS

Max Ernst, Lohengrinstrasse 14, 85 Nurnberg, Germany

Filed Aug. 6, 1970, Ser. No. 61,739
Claims priority, application Germany, Aug. 7, 1969, G 69 31 193.9
Int. Cl. H01h 3/00
U.S. Cl. 335—190 10 Claims



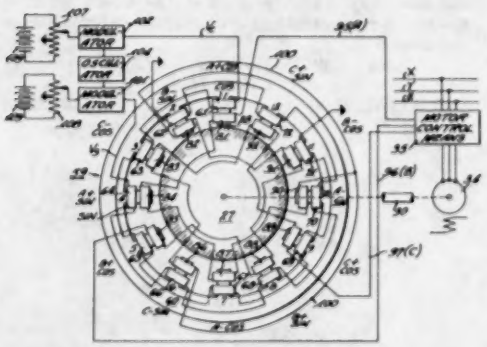
An electromagnetically operated control device, especially for a toy and model railroad, in which a disc is driven slowly in rotation by a vibrating armature and on one side has an eccentric for actuating a reciprocable element and on the other side has a plurality of annular contact paths engaged by contact fingers. When a coil adjacent the armature is energized to set the disc in motion, one contact path thereon provides for keeping the coil energized for 180° of travel of the disc while another contact path provides for intermittent sounding of a signal during one of the periods of rotation of the disc. The initiation of coil energization can be accomplished by manual switches or by switches operated by a train on the track of the railroad. The disc may cause a crossing gate to swing down to closed position during one 180° of travel of the disc and then to swing up to open position during the next 180° of travel of the disc.

3,641,467

ROTARY INDUCTOR

William L. Ringland, Greendale, and Ernest K. Kaeser, West Allis, both of Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed May 13, 1969, Ser. No. 824,176
Int. Cl. H01f 33/00, 21/06
U.S. Cl. 336—5 22 Claims



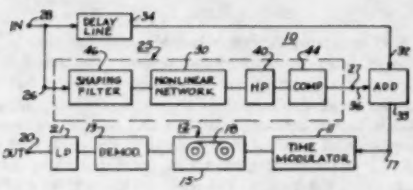
A rotary inductor has an annular stator with angularly displaced radial teeth, an energizing winding having turns encircling individual teeth to induce magnetic fluxes therein, an output winding having turns encircling individual teeth preferably displaced 180 electrical degrees apart connected in subtractive relation to cancel the base component of the magnetic flux, and a ferromagnetic rotor rotatable within the stator to cyclically modulate the permeances of the flux paths extending through the teeth and across the airgap into the rotor and thus cyclically vary the magnitude of the magnetic flux linking the turns of the energizing and output windings encircling each tooth. The preferred embodiment is a three-phase vector adder and has two energizing windings having turns surrounding sets of first and second teeth displaced 90 electrical degrees, three-phase output winding each of which has turns surrounding individual first teeth and second teeth, the three-phase output windings surrounding teeth displaced 120 electrical degrees on the stator, and the rotor being contoured so that the permeances of the magnetic flux paths through the teeth and across the airgap into the rotor vary substantially sinusoidally.

3,641,468

TIME-MODULATING APPARATUS

Wayne K. Hodder, Glendora, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Feb. 9, 1970, Ser. No. 9,776
Int. Cl. H03c 3/08
U.S. Cl. 332—9 12 Claims



An apparatus with error signal precorrection for time-modulating an information signal, which upon demodulation tends to be accompanied by an unwanted component, comprises a time modulator and auxiliary circuits. The auxiliary circuits include a network for providing an error signal having a frequency equal to the difference between the average sampling frequency of the time-modulation and the frequency of the unwanted component, and a network for combining the error signal with the information and for applying these combined signals to the time modulator for simultaneous modulation, whereby the error signal precorrects the information signal for the above mentioned unwanted component.

3,641,469

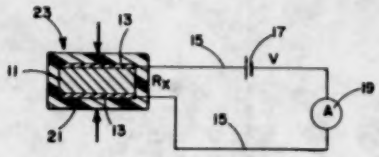
ELECTRIC FUSE

Luigi Pramaggiore, Corsa Battaglione Aosta 14, Aosta, Italy

Filed Sept. 9, 1970, Ser. No. 70,853
Claims priority, application Italy, Apr. 11, 1970, 68234 A/70
Int. Cl. H01h 37/76
U.S. Cl. 337—404 5 Claims

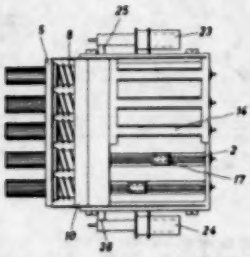
An electric fuse, especially for electric lighters in motor vehicles, comprising electrically conductive fusible means for releasing at a given temperature an electrically conductive metal plate to open the electric circuit and interrupt the supply of current.

3,641,470
PRESSURE TRANSDUCER
Alan Rembaum, Altadena, Calif., and Allen M. Hermann, New Orleans, La., assignors to California Institute of Technology, Pasadena, Calif.
Filed Sept. 18, 1969, Ser. No. 858,950
Int. Cl. H01c 9/06
U.S. Cl. 338—99 6 Claims



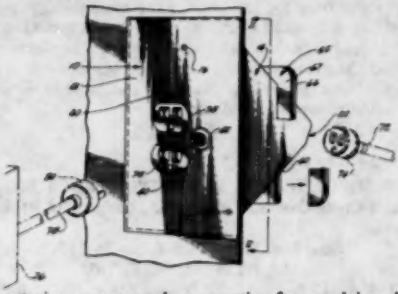
Crystals of a monomeric charge-transfer complex of pyrenetetracyanoethylene are found to have an electrical conductivity that is extremely pressure dependent, such that these crystals can form the sensing element of a novel pressure transducer.

3,641,471
ADJUSTING UNIT
Wolfgang Labude, and Josef Kohler, both of Bad Neustadt/Saale, Germany, assignors to Preh Elektrofeinmechanische Werke, Jakob preh, Nachf., Bad Neustadt/Saale, Germany
Original application Sept. 30, 1965, Ser. No. 491,708, now Patent No. 3,522,542, dated Aug. 4, 1970. Divided and this application Aug. 4, 1969, Ser. No. 847,220
Int. Cl. H01c 9/02
U.S. Cl. 338—128 9 Claims



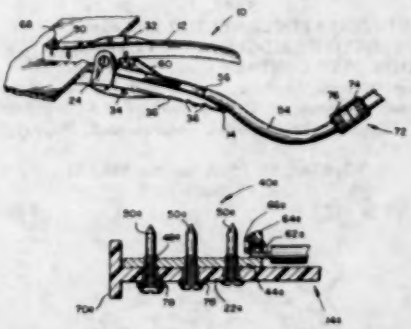
An adjusting unit for producing stored, selectively adjustable working voltages for control and tuning elements, more particularly varactors, comprising variable strip resistances for operation in a voltage divider circuit, said variable resistances being combined into a component, mutually releasable operating elements being mounted on the adjusting unit, said voltage dividers having wiper contacts selectively connectable to a contact rail and being adjustably movable along a track for varying the tapped voltage by means of said elements, said resistances having a common initial and end connecting rails, arranged substantially at right angles to them, and the resistance component representing a ladder-like structure with side rails corresponding to the initial and end rails and the rungs constituting resistances proper, said resistance component being made of a rectangular insulation plate provided with a homogeneous resistance layer for producing a nonlinear resistance curve by stamping out non-rectangular openings so that said resistance strips have different widths along said wiper track.

3,641,472
EXTERIOR POWER SUPPLY CONNECTION FOR RECREATION VEHICLES
Lawrence Phillips, Jr., Laguna Beach, Calif., assignor to Unicorn Industries, Inc., Anaheim, Calif.
Filed Sept. 14, 1970, Ser. No. 71,835
Int. Cl. H01r 33/00, 13/60
U.S. Cl. 339—10 10 Claims



An exterior power supply connection for supplying electrical power from a permanent power source to the interior of a recreation vehicle is adapted to be mounted in aligned openings in the walls of the vehicle, with a faceplate inside the vehicle and a slanted rainproof shield outside the vehicle. A pair of slots in opposite lateral walls of the adapter receive the outer shell of the vehicle and a clamping frame. A fastener between the frame and the shield causes the frame and the faceplate to bear tightly on the vehicle walls to secure the supply connection in place. A female receptacle mounted in the faceplate faces the interior of the vehicle, and a male receptacle disposed in a compartment located under the shield faces the outside. A slanted, downwardly opening coverplate is spring biased to cover the male receptacle. In use, a connector on a cord from the power supply is connected with the male receptacle in the compartment to supply power through the female receptacle to the interior of the vehicle.

3,641,473
VEHICLE-GROUNDING CLAMP
Thomas J. Attaway, 50 S.E. 14th St., Dania, Fla.
Filed May 28, 1970, Ser. No. 41,249
Int. Cl. H01r 11/22
U.S. Cl. 339—14 R 7 Claims



A grounding clamp is constructed of two arms pivotally interconnected intermediate the ends thereof with each arm having a handle end and a jaw end. The jaw ends of the arms are spring biased toward one another. The arms of the clamp are formed of a synthetic plastic having high electrical insulating characteristics. Replaceable metal jaw elements are secured to the jaw ends of the arms and the jaw elements include perpendicularly projecting spiked teeth. The teeth of each jaw element project toward the opposite jaw element,

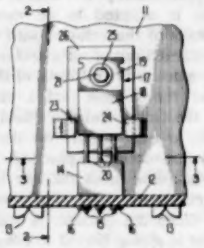
and the tips of the teeth of each jaw element lie in substantially parallel planes. An electrical lead extends to each jaw element with one of the leads grounded and the other lead in series circuit with a signal triggering device. When the clamp engages a portion of the vehicle to be grounded between the teeth, the vehicle is grounded and the triggering circuit completed through the vehicle. In an alternate embodiment, the teeth are formed by the pointed ends of mounting bolts which extend from the jaw ends of the arms through the jaw elements. A snap apart electrical connector is provided in an electrical lead cable which extends between an electrostatic drain and the clamp and the connector will open to prevent damage of the grounding clamp if the vehicle is moved without first removing the clamp.

3,641,474

SEMICONDUCTOR MOUNTING STRUCTURE

Raymond Clyde Owens, Carmel, Ind., assignor to RCA Corporation

Filed May 11, 1970, Ser. No. 36,057
Int. Cl. H02b *1/02*; H05k *1/02*
U.S. Cl. 339—17 L **8 Claims**



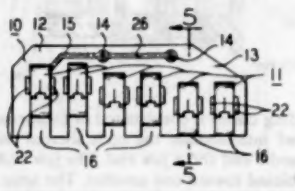
The electrode leads extending from the body of a capsule enclosing a heat-generating semiconductor device are plugged into a connector socket affixed to a circuit board and the mounting tab of the capsule is connected by a screw in good heat-conducting contact to a heat-dissipating metal plate attached to the circuit board, the capsule being prevented from moving laterally when the screw is tightened by two spaced blocks positioned on the metal plate at the sides of the capsule body.

3,641,475

INTERCEPT CONNECTOR FOR MAKING ALTERNATIVE BRIDGING CONNECTIONS HAVING IMPROVED CONTACT CLIP CONSTRUCTION

Carleton D. Irish, Neptune, and Harold Painkin, Matawin Township, Monmouth County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 18, 1969, Ser. No. 886,181
Int. Cl. H05k *1/02*
U.S. Cl. 339—17 L **7 Claims**



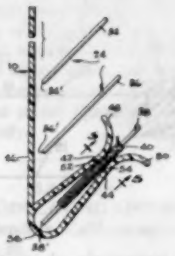
An intercept connector for providing alternative bridging connections between terminals is disclosed in which circuit paths and contact clips are combined on a circuit board in predetermined circuit configurations.

3,641,476

TELEPHONE TERMINAL CLIP-ON PROTECTOR

King B. Drake, Los Angeles, Calif., assignor to Dracon Industries, Chatsworth, Calif.

Filed Mar. 12, 1970, Ser. No. 18,831
Int. Cl. H01r *13/44*, *13/60*
U.S. Cl. 339—36 **11 Claims**



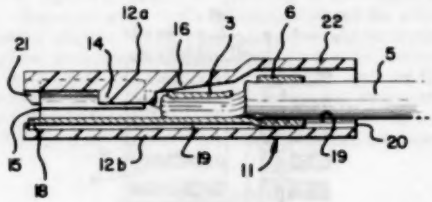
The telephone terminal clip-on protector has a pair of opposed engagement jaws which are integrally formed together with a protection flange so that, when the jaws engage a telephone terminal, the flange extends over adjacent terminals to protect the terminals and to protect workers from being scratched by the terminals.

3,641,477

HOUSING FOR AN ELECTRICAL TERMINAL

Roberto Plana, Barcelona, Spain, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 25, 1970, Ser. No. 14,139
Claims priority, application Spain, Mar. 22, 1969, 146,825
Int. Cl. H01r *11/02*, *9/08*
U.S. Cl. 339—59 R **5 Claims**



An insulating molded synthetic plastic housing for an electrical terminal, the housing being of generally tubular shape and open at both ends. The housing is deformed during entry of the terminal and subsequently returns to its original shape to lock the terminal in position.

3,641,478

SEPARABLE PLUG

Paul C. Savoca, Massapequa, N.Y., and Anthony D. Marasco, Norwalk, Conn., assignors to J. B. Nottingham & Co., Inc., New York, N.Y.

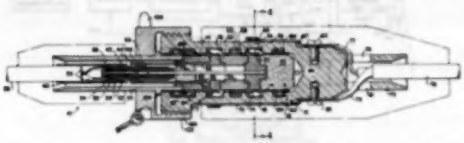
Filed July 3, 1969, Ser. No. 838,749
Int. Cl. H01r *21/04*
U.S. Cl. 339—63 M **4 Claims**

An electrical plug is provided consisting of a body member loosely receiving the cable and a plug member separable from the body member and carrying the terminals for the cable and the prongs of the plug. When damaged, these prongs, or the body member as a whole, can readily be replaced and thereby discarding of the cable and plug assembly avoided. The body portion of the plug is of hollow, skirtlike structure, the cable being capable of being slid

through the body to expose the terminals of the plug. The plug and body have interfitting parts forming pressure seals which render the interior of the body, and hence the ter-

minals and conductors of the plug member, immune against the entry of water, moisture, or other foreign matter, particularly in portable equipment exposed to the weather.

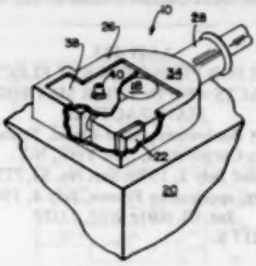
3,641,479
UNDERWATER DISCONNECTIBLE CONNECTOR
Donald G. O'Brien, Framingham, and Edward R. Walker, South Natick, both of Mass., assignors to D. G. O'Brien, Inc., Framingham, Mass.
Filed June 16, 1969, Ser. No. 833,614
Int. Cl. H01r *13/54*
U.S. Cl. 339—94 R **14 Claims**



An electrical connector of the plug and socket type for use in an electrically conductive environment such as under water. The plug is cylindrical in shape and carries a number of axially spaced contactor bands which are exposed at and in flush relation to the cylindrical surface. The socket, which is of greater diameter than the plug, has an equal number of axially spaced annular contacts which protrude inwardly into the socket to engage the contactor bands of the inserted plug. Each connected pair of contacts is isolated and sealed from the other connected contacts and from the surrounding environment by resilient O-rings supported in the socket and axially spaced in alternating arrangement with the socket contacts. Insertion of the plug causes the O-rings to be compressed radially between the cylindrical surface of the plug and the internal surface of the socket.

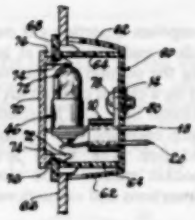
3,641,480
BATTERY TERMINAL GUARD
Edward L. Robin, 115 Glacier Circle, Vacaville, Calif.
Filed Apr. 5, 1971, Ser. No. 130,988
Int. Cl. H01r *11/26*
U.S. Cl. 339—116 R **5 Claims**

A device for preventing the corrosion or sulfation of a cable connector on the battery terminal includes a flexible casing that fits snugly around the connector and the base of the terminal. A top cover element retained by the casing has



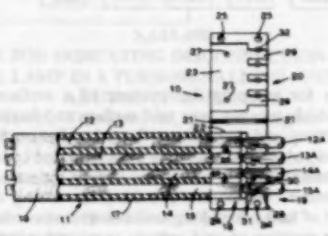
a grease fitting so that corrosion preventive material can be forced into the casing to surround the connector.

3,641,481
LAMP SOCKET CONSTRUCTION
Guy M. Farrell, 261 Poplar, Elmhurst, Ill.
Filed Feb. 2, 1970, Ser. No. 7,944
Int. Cl. H01r *13/66, 19/22*
U.S. Cl. 339—126 R **5 Claims**



A lamp socket construction comprising a bracket and a first conductor mounted on the bracket comprising a pair of spaced-apart arms for receiving the peripheral contact portion of a lamp. A second conductor is mounted on the bracket in spaced relationship with the first conductor, and the second conductor includes a resilient contact arm for engaging the end contact portion of the lamp. The socket can be mounted in a housing for display on an instrument panel, and this assembly is designed so that the lamp can be replaced from the front of the panel.

3,641,482
PLUG CONNECTOR FOR FLAT CONDUCTOR STRIP LINE
Klaus Bretting, Heroldsberg, Germany, assignor to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany
Filed June 25, 1970, Ser. No. 49,656
Claims priority, application Germany, July 1, 1969, P 19 33 229.7
Int. Cl. H01r *33/74*
U.S. Cl. 339—196 M **1 Claim**



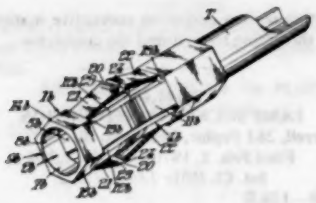
A terminal connector for a flat conductor strip line having its conductor strips in spaced-parallel arrangement, the ter-

minal portion of the strip being received in a flat connector construction in which contacts are arranged for conductive engagement with the respective conductors of the strip.

3,641,483
SOCKETS FOR PRONG SOCKET ELECTRICAL CONTACTS AND IN THEIR METHODS OF MANUFACTURE

Francois Robert Bonhomme, Saint-Cloud, France, assignor to Connectronics Corporation, New York, N.Y.

Filed July 2, 1970, Ser. No. 51,773
Claims priority, application France, July 4, 1969, 6922890
Int. Cl. H01r 9/12, 11/22
U.S. Cl. 339—217 S **10 Claims**

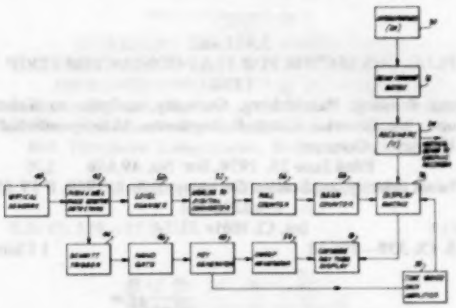


The socket comprises a portion cut out into contact strips by longitudinal slots and has, over at least a fraction of its length comprising the portion cut into strips, a cross section internally limited by a closed continuous curve and externally by a polygonal closed line. The longitudinal slots are closed at their longitudinal ends and pass through the vertices of the polygonal closed line. The strips are concave in axial direction. The socket ensures good electrical contact even after numerous insertions and extractions.

3,641,484
CONTOUR-MAPPING SYSTEM

Donald J. White, Natick, and William R. Navin, Jr., Raynham, both of Mass., assignors to General Instrument Corporation, Newark, N.J.

Filed Mar. 10, 1970, Ser. No. 18,137
Int. Cl. G01s 9/66
U.S. Cl. 340—3 R **8 Claims**

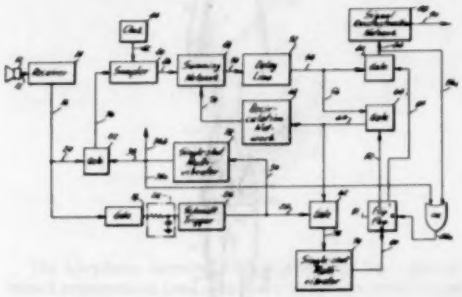


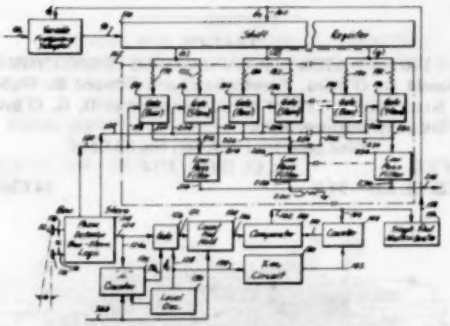
A system for mapping the contour of a surface from a mapping vehicle moving over said surface and having means for transmitting and receiving reflected radiation from said surface and which includes a display scope adapted to produce a visual trace in successive sweeps representing said surface contour. Means are provided for timing the commencement of said trace along said sweep in accordance with the angular position of said vehicle receiving means so that the angular position of said trace corresponds to the true angular position of said vehicle with respect to the vertical.

3,641,485
ECHO SIMULATION MEANS

Francis J. Murphree, Winter Park, and Michael T. Marrero, Casselberry, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 25, 1970, Ser. No. 40,179
Int. Cl. G01s 9/66
U.S. Cl. 340—3 E **8 Claims**





Synthetic sonar echoes are generated in response to a sonar signal by utilizing a delay line, time compression technique to generate a reconstructed waveform which is then sampled to provide a pulsed input to a shift register means having taps spaced therealong corresponding to structural highlight positions along a target. The shift register is caused to serve as a variable delay line by varying the sampling and shift rate in response to aspect angle as determined by phase-sensitive logic means. The taps feed a network of attenuators and filters which produce across an output resistor an electrical signal which can be amplified and used to drive a sound projector to produce the desired simulated echo.

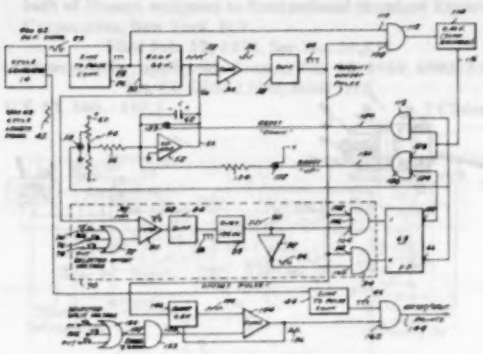
3,641,486
LOCAL CONTROLLER FOR TRAFFIC CONTROL SYSTEM

Peter C. Brockett, Milford, and Ludwig R. Pallat, Stanford, both of Conn., assignors to LFE Corporation, Waltham, Mass.

Filed June 23, 1969, Ser. No. 835,343
Int. Cl. G08g 1/07
U.S. Cl. 340—41 **9 Claims**

A local controller for use in a traffic control system is provided with all solid-state means for displacing the local traffic cycle relative to a master traffic cycle and for effecting the

smooth transition between alternate displacements. The traffic cycle length is determined by measuring the period between the phase coincidence of two signals having a slight difference in frequency.

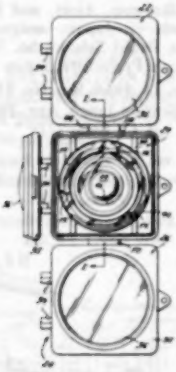


3,641,487

TRAFFIC CONTROL LIGHT WITH MEANS RESPONSIVE TO A POWER FAILURE

John J. Rogers, West Miami Shores, and John A. Stratman, West Hollywood, both of Fla., assignors to Lumidor Products Corp., Miami, Fla.

Filed Oct. 29, 1969, Ser. No. 872,173
Int. Cl. G08g *1/095*
U.S. Cl. 340—46 **11 Claims**



A traffic control light is provided with a supplemental lamp which is illuminable by a secondary power source. Switching means are also provided which are responsive to a failure of the primary power source to connect the supplemental lamp to the secondary source so that the supplemental lamp is illuminated in a flashing mode to continue traffic control.

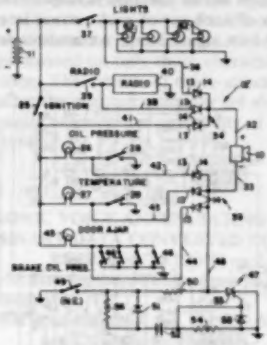
3,641,488

MULTIPLE-CONDITION AUTOMOTIVE ALARM SYSTEM

William F. Mullin, Indianapolis, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of application Ser. No. 639,944, May 22, 1967, now abandoned. This application Sept. 21, 1970, Ser. No. 74,196
Int. Cl. G08b *7/00*
U.S. Cl. 340—52 F **9 Claims**

An electrical audible alarm unit connected across a vehicle battery through a number of switches for indicating the presence of one of a number of conditions or malfunctions. Isolation diodes are used at avoid the coupling of electrical circuits within the vehicle. Switches may be connected to both terminals of the alarm unit, with or without isolation diodes, to provide a warning signal only when certain conditions are met.

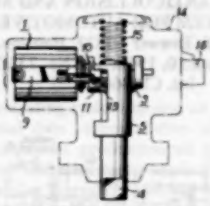


3,641,489

STEERING COLUMN LOCK FOR VEHICLES

Yoshisada Shimomura, Tokyo-to, Japan, assignor to Yushin Seiki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 8, 1969, Ser. No. 864,767
Claims priority, application Japan, Oct. 12, 1968, 43/88705
Int. Cl. B60r *25/02, 25/10*
U.S. Cl. 340—52 D **3 Claims**



A retractable steering column lock for vehicles. The lock is urged by a spring to a locking position and can be retracted from the locking position into a retracted position releasing the steering column for turning movement. A rotary key-operated assembly forms part of the ignition switch structure and coacts through a motion transmission with the lock for retracting the latter to its retracted position when the ignition switch is turned on. A swingable lever assembly responds to turning on of the ignition switch for releasably holding the lock in its retracted position while when the ignition switch is turned off and the key is withdrawn, the lock is automatically released for return to its locking position.

3,641,490

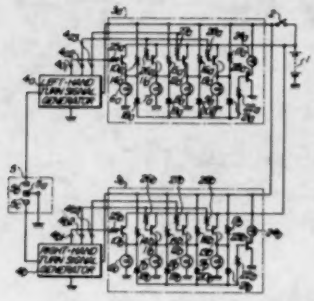
DEVICE FOR INDICATING DISCONNECTION OF TURN SIGNAL LAMP IN A TURN-SIGNALLING SYSTEM FOR AUTOMOTIVE VEHICLE

Hisashi Kawai, Toyohashi-shi, Japan, assignor to Nippon Denso Company Limited, Kariya-shi, Japan

Filed June 10, 1969, Ser. No. 831,845
Claims priority, application Japan, June 14, 1968, 43/41062; July 16, 1968, 43/50091
Int. Cl. G08b *21/00;* **B60q** *1/38*
U.S. Cl. 340—55 **15 Claims**

A device for indicating disconnection of turn signal lamps having a power source, a turn signal generator, a plurality of

current-interrupting elements controlled by said turn signal generator, a plurality of turn signal lamps connected to said power source through the respective current-interrupting elements, a plurality of series circuits of a resistor and a diode or of two resistors whose junction is respectively connected to the junction of each set of said current-interrupting element and said turn signal lamp, a transistor whose base is



connected through a resistor or directly to said series circuits so that it constitutes an OR circuit together with said series circuits and said resistor if used, said OR circuits being connected to said power source in such a manner that it is placed in operation in response to the closure of a key switch, and a turn signal indicator connected to said power source through the collector and emitter of said transistor in said OR circuit.

3,641,491

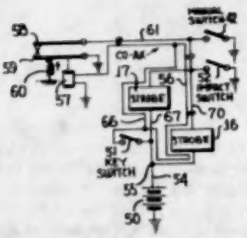
AUTOMATIC ANTICOLLISION AND ACCIDENT MARKER SYSTEM FOR AUTOMOTIVE VEHICLE

James Reynolds Bath, Drawer 60337, Houston, Tex.

Filed June 10, 1968, Ser. No. 735,776

Int. Cl. B60q *1/00*

U.S. Cl. 340—61 **4 Claims**



An impact switch mounted on a vehicle controls high-intensity condenser discharge lights (hereinafter called strobe lights) also mounted on the vehicle. The strobe lights may be turned on in response to operation of an impact switch, through circuit interruption, or manually at will. Strobe lights emit light having a spectrum which is largely in the blue, which is readily visible in rain and fog, and peak intensity of light emission is at least 10 times greater than that of a standard beam.

3,641,492

VEHICLE ANTITHEFT DEVICE UTILIZING CIGARETTE LIGHTER AS TIMER

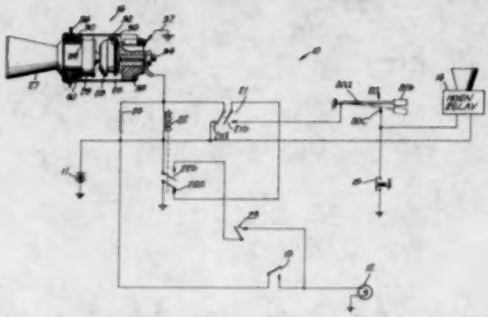
David Vinokur, 16217 Dalark St., La Puente, Calif.

Filed Mar. 30, 1970, Ser. No. 23,903

Int. Cl. B60r *25/10*

U.S. Cl. 340—65 **5 Claims**

A vehicle antitheft accessory readily connectable in circuit with the vehicle electrical system for the horn, running lights and the customary cigarette lighter, and utilizing the latter as a timer to temporarily deactivate an antitheft alarm but not the vehicle lights to permit the driver to exit, lock the vehicle and leave the immediate vicinity. Termination of the lighter



timing cycle automatically arms the alarm device and any attempt to enter or move the vehicle is effective to energize the alarm intermittently and irregularly thereby alerting bystanders to the fact that a vandal or unauthorized person is attempting to enter or molest the vehicle.

3,641,493

COMBINATION TURN-SIGNAL AND HAZARD-WARNING SIGNAL SYSTEM

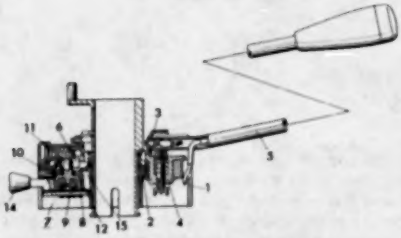
Masaru Suzuki, Hekikai-gun, Aichi, and Masayoshi Hyodo, Toyota, Aichi, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishihiwajima-cho, Nishikasugaigun, Aichi Prefecture, Japan

Filed Apr. 23, 1969, Ser. No. 818,537

Claims priority, application Japan, Apr. 29, 1968, 43/28727

Int. Cl. B60q *1/38*

U.S. Cl. 340—81 F **10 Claims**

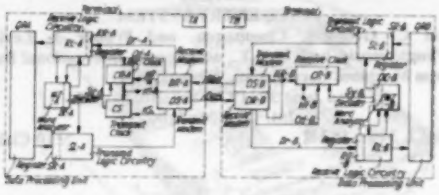


A combination turn signal and hazard-warning-signal system having movable contact means disposed for coaction with stationery contact means to permit energization of the right and left vehicle indicator lights. The movable contact means is mounted within a casing which is displacable in response to movement of a turn signal control lever for permitting energization of either the right or left indicator lights. The casing is also manually movable to a position wherein the movable contact means engages the fixed contact means irrespective of the position of the control lever for causing simultaneous flashing of both the right and left indicator lights.

3,641,494
BIDIRECTIONAL DATA TRANSMISSION SYSTEM WITH ERROR CORRECTION

Jean Perrault, Port Marly, and Adelin E. G. Salle, Versailles, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 12, 1970, Ser. No. 10,837
Claims priority, application France, Feb. 14, 1969, 6903551
Int. Cl. G08c *25/00*; **H04l** *1/10*
U.S. Cl. 340—146.1 **7 Claims**

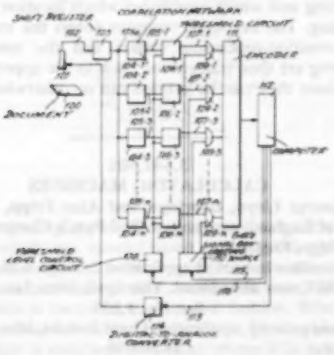


A bidirectional data transmission system for transmitting information between two terminal stations incorporating in each terminal station an arrangement for checking the received data and providing error correction when errors are detected in the received data. Each of the terminals include a memory for storing the *m* last words transmitted from that terminal. When an error is detected in one terminal, the transfer of received data to a data processor is blocked and a repetition request word is generated and transmitted to the other terminal. The other terminal detects the presence of the repetition request word in the received data and transmits a repetition start word and the last *m* data words stored in the memory to said one terminal to accomplish the error correction.

3,641,495
CHARACTER RECOGNITION SYSTEM HAVING A REJECTED CHARACTER RECOGNITION CAPABILITY

Kazuo Kiji, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Continuation-in-part of application Ser. No. 664,424, Aug. 30, 1967, now abandoned. This application Aug. 12, 1970, Ser. No. 63,162
Claims priority, application Japan, Aug. 31, 1966, 41/57403
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3 R **6 Claims**

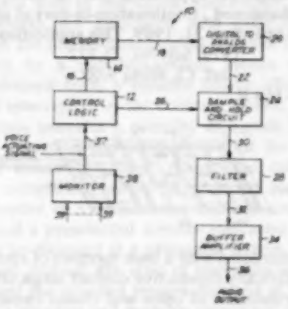


A character recognition system for reading alphanumeric characters and/or symbols printed or otherwise formed upon a document. The characters on the document are initially scanned in sequential fashion to generate a signal representative of the character. The representative signal is compared, on a character by character basis, against standardized signals each representing high quality criteria of those characters which the system is capable of recognizing. A signal is generated to indicate any character which fails recognition. After each of the characters are scanned and either identified as valid characters or are rejected, an analysis is made to determine the greatest likelihood of the identity of the rejected character or characters. A second scanning operation is performed on only those characters which have failed recognition. The criteria of those standardized signals compared against the rejected character are also significantly reduced to greatly enhance the probability of recognition of rejected characters.

3,641,496
ELECTRONIC VOICE ANNUNCIATING SYSTEM HAVING BINARY DATA CONVERTED INTO AUDIO REPRESENTATIONS

Martin J. Slavin, Huntington, N.Y., assignor to Phonplex Corporation, Huntington, N.Y.

Filed June 23, 1969, Ser. No. 835,525
Int. Cl. H04q *3/00*, *5/00*
U.S. Cl. 340—148 **11 Claims**



A voice annunciating system having an electronic memory for storing digital data representative of the analog audio signal of a plurality of predetermined sound components, selected series of said data being applied from said memory to a digital to analog converter adapted to produce an audio signal corresponding to the digital data applied thereto, by means of a control logic. The control logic is operative in response to an actuating signal associated with the desired message. Substantially all redundancy is eliminated from the digital data stored in the memory, said control logic being adapted to repetitively apply individual sound components or series of sound components to the digital to analog converter for reconstructing the desired message.

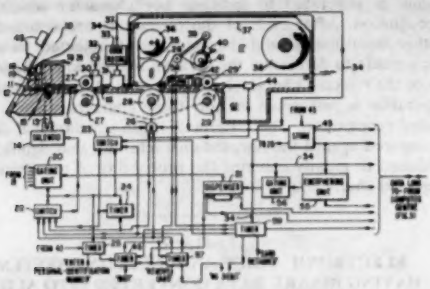
3,641,497
ACCESS-CONTROL EQUIPMENT AND ITEM-DISPENSING SYSTEMS INCLUDING SUCH EQUIPMENT

Geoffrey Ernest Patrick Constable, Cheltenham, England, assignor to Smiths Industries Limited, Cricklewood, London, England

Filed Aug. 19, 1969, Ser. No. 851,186
Claims priority, application Great Britain, Aug. 30, 1968, 41,424/68
Int. Cl. H04q *9/00*; **G06k** *7/00*
U.S. Cl. 340—149 A **14 Claims**

A money-dispensing system is operative to dispense money in response to a bank customer's embossed credit card and keyed-entry of his personal identification number, only if this number accords with the customer's account number as read from an accounting record impressed from the card. Accord is checked at the bank's central computer and approval for dispensing is given by an encyphered signal individually generated there using the account number and transmitted

back to the dispensing terminal, recognition of the encyphered signal, required for operation of the dispenser,



being effected by separate programmed-generation of it at the terminal.

3,641,498

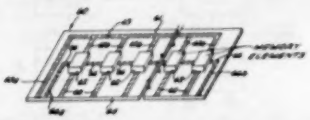
KEYS FOR ELECTRONIC SECURITY APPARATUS

Robert A. Hedin, San Pedro, Calif., assignor to R. B. Phinizy, Anaheim, Calif.

Continuation-in-part of application Ser. No. 628,599, Apr. 5, 1967, now abandoned , Continuation-in-part of application Ser. No. 889,666, Dec. 31, 1969. This application Mar. 27, 1970, Ser. No. 23,272

Int. Cl. H04q 9/00

U.S. Cl. 340—164 R 25 Claims



A key is constructed with a base member of epoxy glass on which are electrically conductive contact strips offering a binary code permutation of open and closed circuit paths for controlling a security apparatus such as an electronic lock or computer. The code permutation can be established in the key by applying electric current that changes the state of the circuits on the key. For the purpose, the key circuits are equipped with fusible elements or magnetic memory elements. The memory elements may be of a type that will change the code when the key is used. The key may have a portion forming an identification card. In further forms the key will have eddy current rings that will react when applied to proper key-receiving means, and the key may comprise an optical mask containing a binary code in the form of a pattern of opaque and translucent areas.

3,641,499

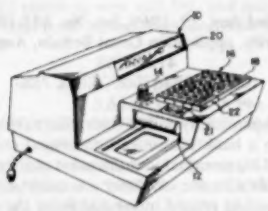
CARD AND VERIFICATION SYSTEM HAVING CARD VOIDING ELEMENT

William A. Housman, 1626 N. 190th, Seattle, Wash.

Filed Dec. 22, 1969, Ser. No. 887,291

Int. Cl. H04q 3/00

U.S. Cl. 340—149 8 Claims



A card is coded with preselected partially completed circuits including selectively positioned insulators, a card reader is coded with second partially completed circuits and a plurality of manually operated contacts which are actuated in an array known only to the owner of the card, a mismatch completes the network through the card reader and the card and energizes a fuse device within the card to void the card. A coded circuit in the card corresponds to the stored amount of credit and an electrical network in the machine is operable by contacts corresponding to the amount of stored credit to complete a circuit to the fuse of the device to void the card when the credit is used up.

3,641,500

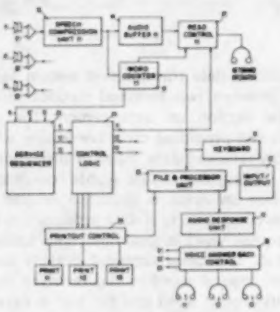
VOICE ENTRY SYSTEM

Evon C. Greanias, Chappaqua, and Wilbur J. Levine, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1970, Ser. No. 51,303

Int. Cl. H04q 9/00

U.S. Cl. 340—152 R 10 Claims



An arrangement is disclosed for making entries into an information system from a plurality of remote locations by voice communications. The arrangement comprises a speech compression means and an audio buffer means associated with each location, the speech compression means functioning to compress the duration of a message whereby a keyboard operator receiving the voice communications can handle a plurality of locations, the audio buffer means being operative to store the compressed message. There is also associated with each location a word counter which contains a count of the words in a message, a count in a word counter signifying that a complete message is in the audio buffer enabling the locations where that message has been entered to have that message processed. The arrangement includes a sequencing unit which establishes which location can receive processing. The keyboard operator enters the messages into an information-processing system and the results of this processing are then transmitted back to the appropriate locations where they can be printed out or otherwise be availed of.

3,641,501

CALCULATING MACHINES

John George Lloyd, Uxbridge, and Alan Fripp, Iver Heath, both of England, assignors to Bell Punch Company Limited, Uxbridge, England

Continuation-in-part of application Ser. No. 626,049, Mar. 27, 1967, now abandoned. This application Jan. 23, 1970, Ser. No. 5,221

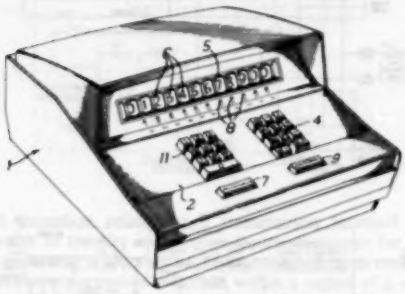
Claims priority, application Great Britain, Mar. 31, 1966, 14,300/66

Int. Cl. G06f 7/02

U.S. Cl. 340—172.5 10 Claims

An electronic calculating machine with two multistage registers and with circuitry controlled by an interchange function key on a keyboard are used to interchange the corresponding digit denominations of the numbers stored in the two registers. The interchange of each digit denomination is

a two-part operation. In the first part a first pulse train is used to simultaneously circulate the digits in the corresponding denomination of the registers in order to store in a counter circuit a difference pulse count equal to the difference between the digits and to obtain a signal whose polarity is dependent upon which register has the larger digit.



In the second part the difference pulse count and the polarity of the signal are used during the second pulse train to control the entry of part of the second pulse train to the one register and then to control the entry of the rest of the second pulse train to the other register so as to interchange the corresponding digits.

3,641,502

DATA RECORDING APPARATUS

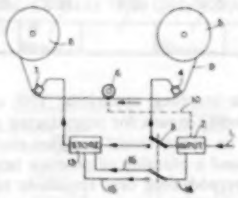
Cecil Thomas Whitehead, Crowthorne, and Anthony Francis Ewart Critchley, Kingston, both of England, assignors to International Computers Limited, London, England

Filed Apr. 17, 1970, Ser. No. 29,579

Claims priority, application Great Britain, Apr. 18, 1969, 19,808/69

Int. Cl. G11b *13/00*

U.S. Cl. 340—172.5 **5 Claims**



A data recording apparatus includes two magnetic recording heads which are spaced apart along the length of an exchangeable magnetic recording tape. A switch normally connects an input data device to the first recording head such that data is recorded in a normal fashion. When it has become necessary to exchange a new tape for an old one, the incoming data is switched to a store where it is held as the tapes are exchanged. When a new tape is ready to record data, the switch is returned to its normal position such that data in the store is recorded by the second recording head concurrently with incoming data being recorded by the first recording head. The heads are spaced apart by a distance such that stored data recorded by the second recording head does not overlap incoming data recorded by the first head.

3,641,503

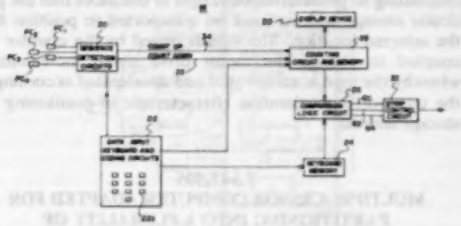
APPARATUS FOR SENSING AND COUNTING IMAGES DISPOSED ON INFORMATION BEARING MEDIA HAVING AN ADDED COUNTING CAPABILITY

Robert E. Cullen, Foxborough, Mass., assignor to Eastman Kodak Company

Filed Apr. 24, 1970, Ser. No. 31,474

Int. Cl. G06f *7/22*

U.S. Cl. 340—172.5 **17 Claims**



Apparatus is disclosed for sensing and counting the number of images disposed on an information-bearing medium such as a strip of microfilm. Specifically, a plurality of counting marks are associated with each of the images disposed on the information-bearing medium and are sensed illustratively by a radiation-sensing means which detects radiation derived from a suitable source alternately transmitted and intercepted by the counting marks. The radiation-sensing means provides a plurality of signals which are applied to a counting and memory circuit for counting the number of marks that have passed the radiation-sensing means. A comparison circuit is provided for producing a signal indicative of a coincidence between counted number of marks and a preselected number indicative of that image which is to be disposed at a utilization station. When a coincidence is so derived, the strip of microfilm will be brought to a stop and the selected images disposed at the utilization station. The counting and memory circuit has a limited capability as to the number of marks which it may count, illustratively determined by the number of decade counters comprising the counting and memory circuit. The counting and memory circuit of this invention is capable of counting numbers of images in excess of its capability and for directing the strip of information-bearing medium in the correct direction to thereby access the selected image at the utilization station.

3,641,504

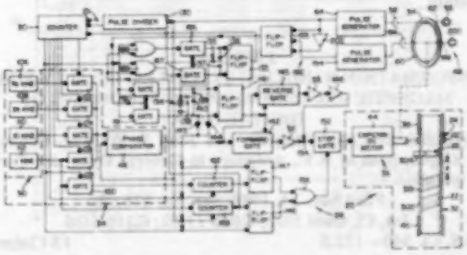
APPARATUS FOR TRANSPORTING A RECORDING MEDIUM FOR STORING INFORMATION

George B. Sidline, Belmont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Feb. 20, 1969, Ser. No. 801,100

Int. Cl. G11b *13/00*

U.S. Cl. 340—172.5 **8 Claims**



A preset counter counts pulses received from a tachometer as a magnetic tape is transported to position a particular

storage address on the tape at a selected location relative to a magnetic head. The pulse count is representative of the distance that the particular storage address must be transported to position it at the selected location. The counter is coupled to the motor drive circuit of the tape transport mechanism to control the speed of the tape movement in accordance with the count stored in the counter. As the particular storage address is transported to position it at the selected location, the counter issues signals while its count is in predetermined ranges of its counting sequence corresponding to predetermined ranges of distances that the particular storage address must be transported to position it at the selected location. The signals issued by the counter are coupled to change the motor drive signal incrementally whereby the tape is accelerated and decelerated according to the transport's acceleration characteristic in positioning the storage address.

3,641,505

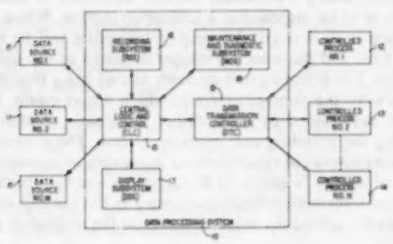
MULTIPROCESSOR COMPUTER ADAPTED FOR PARTITIONING INTO A PLURALITY OF INDEPENDENTLY OPERATING SYSTEMS

Walter M. Artz, Succasunna; Kenneth R. Cornelius, Parsippany; John W. Olson, Morris Township, Morris County, all of N.J.; Gary R. Signor, Burlington, N.C., and Francis E. Slojkowski, Millburn, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., by said Artz, said Cornelius, said Olson and said Slojkowski and Western Electric Company, Incorporated, New York, N.Y., by said Signor

Filed June 25, 1969, Ser. No. 836,242

Int. Cl. G06f *9/00, 15/00*

U.S. Cl. 340—172.5 **13 Claims**



A multiprocessor computing system is disclosed in which a number of processing units, program storage units, variable storage units and input-output units may be selectively combined to form one or more independent data processing systems. System partitioning into more than one independent system is controlled alternatively by manual switching or program-directed partitioning signals. Isolation of single units and segmentation of a plurality of units less than a full operating system are also controlled by the same lockout system.

3,641,506

INFORMATION HANDLING SYSTEM ESPECIALLY FOR MAGNETIC RECORDING AND REPRODUCING OF DIGITAL DATA

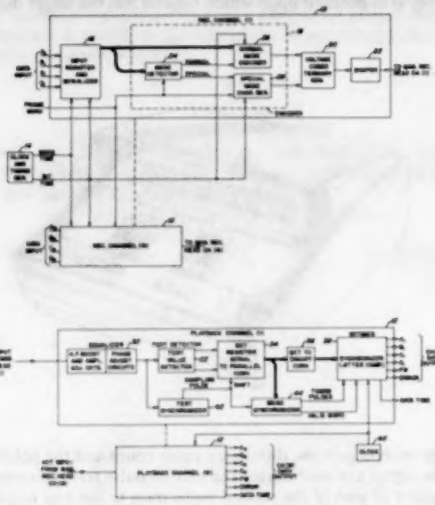
Frederick B. Cupp, Fairport, and John S. Whiting, Canandaigua, both of N.Y., assignors to General Dynamics Corporation

Filed Nov. 14, 1969, Ser. No. 876,980

Int. Cl. G06f *5/02*; **G05b** *13/02*; **G11b** *5/86*

U.S. Cl. 340—172.5 **13 Claims**

A system for storage on a magnetic record medium (tape or disc) of data with an extremely high packing density is described. Binary input information is encoded into a ternary signal for recording. That ternary signal has spectral properties which facilitate recording with extremely high bit packing density. The ternary signal also contains timing information. On playback the signal is decoded into binary coded ternary form. Timing information with respect to words of ternary data, as well as the individual terts which



make up the works, is also derived. The system includes means for synchronizing the reproduced data in accordance with the timing information derived from the data itself, as well as with an external clock, and decodes the data into the original binary form.

3,641,507

ELECTRONIC TEACHING APPARATUS

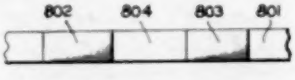
Masahiro Kosaka, and Tadamasa Fujita, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 3, 1969, Ser. No. 881,766

Claims priority, application Japan, Dec. 6, 1968, 43/90683; Dec. 9, 1968, 43/91266; Dec. 10, 1968, 43/92151

Int. Cl. G06k *17/00*; **G09b** *5/04, 19/04*

U.S. Cl. 340—172.5 **5 Claims**



An electronic teaching apparatus. The apparatus comprises a reproducing means for reproducing an instructional tape which has an instructional program recorded intermittently thereon, and a plurality of practice tape recorders for recording and reproducing oral responses of a plurality of learners.

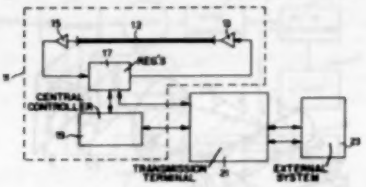
A first detecting means is provided for generating a detecting signal upon the occurrence of reproduction of one part of said instructional program, and a first control means coupled to said first detecting means for controlling said practice tape recorders and a memory means after receiving said detecting signal from said first detecting means. A second detecting means is provided for generating and detecting signal upon the occurrence of reproduction of one part of said instructional program and is coupled to a second control means for controlling said instructional tape recorder and said practice tape recorders after receiving said detecting signal from said second detecting means.

The memory means stores a value of the time interval between the detecting signal from said first detecting means and the detecting signal from said second detecting means, and produces a control pulse after a time which is the same as said time interval stored in said memory means.

3,641,508
TRANSMISSION TERMINAL

Fabrizio Saltini, Modena, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Dec. 31, 1969, Ser. No. 889,758
Claims priority, application Italy, Feb. 12, 1969, 50559-A/69
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 8 Claims

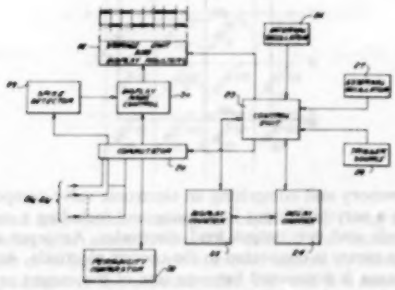


This invention relates to a transmission terminal unit responsive to transfer instructions from a computer for serially transferring a plurality of information segments one at a time between successive locations within a region of a serial memory of the computer and an external system. The transmission terminal comprises buffer means for temporarily storing an information segment presently being transferred, means for serially transferring the information segments between said buffer means and the successive locations in the serial memory. Furthermore the transmission terminal comprises means responsive to the instructions from the computer for controlling the direction of transfer of the information segments by said transferring means and to signals from said computer and said external system for controlling the timing of the transfer by enabling, after the receipt of a ready signal from the external system, said transferring means to operate to transfer the next successive information segment when the location within the region of the serial memory which is next to be operated upon is available for transfers.

3,641,509
DIGITAL DATA ANALYSIS AND DISPLAY DEVICE

Philip S. Di Vita, Richboro; Earl N. Powers, Philadelphia, and Charles J. Werneth, Newtown, all of Pa., assignors to Data Display Systems, Inc., Willow Grove, Pa.

Filed May 2, 1969, Ser. No. 821,211
Int. Cl. G11c 7/00; G01r 13/04
U.S. Cl. 340—173 R 11 Claims

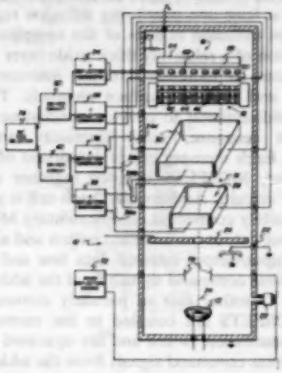


Apparatus for the analysis and display of digital waveforms comprising a commutator arrangement for selectively distributing input information from a plurality of sources to predetermined storage and display units and for selectively modifying the display characteristics of said input information with respect to time, mode of representation and the relative proportion of the cyclic input information signal to be displayed.

3,641,510
BEAM ADDRESSABLE MASS STORAGE USING THIN FILM WITH BISTABLE ELECTRICAL CONDUCTIVITY

Arthur C. M. Chen, Schenectady, N.Y., assignor to General Electric Company

Filed Jan. 2, 1970, Ser. No. 145
Int. Cl. G11c 11/42
U.S. Cl. 340—173 CR 7 Claims

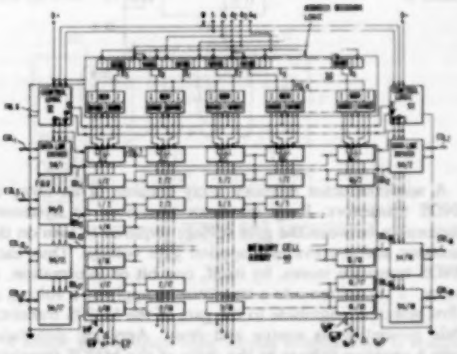


An electron beam addressable mass memory and recording technique is described wherein information is stored by selective electron beam irradiation of bit sites in a target characterized by a thin film of a bistable conductivity material, e.g., an arsenic-tellurium-germanium glass, to switch the electrical resistance of the irradiated sites. The recorded information subsequently is nondestructively read out by impinging a lower intensity electron beam upon each bit site and measuring current flow through the site to a metal substrate juxtaposed with the bistable conductivity film. To erase recorded information, the switch bit site is irradiated with an electron beam having an intensity above the threshold level required to return the site to the original resistance state.

3,641,511
COMPLEMENTARY MOSFET INTEGRATED CIRCUIT MEMORY

James R. Cricchi, Baltimore, and Edgar D. Lancaster, Jr., Linthicum Heights, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 6, 1970, Ser. No. 9,381
Int. Cl. G11c 11/40, 5/02, 7/00
U.S. Cl. 340—173 R 13 Claims



A random access nondestructive voltage readout complementary MOSFET memory fabricated on a single integrated circuit "chip," including not only a plurality of identical

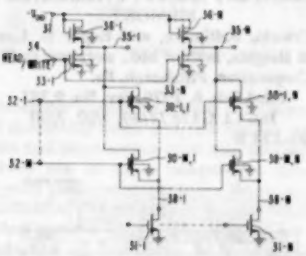
memory cells arranged in a matrix array, but also the digital address decoding logic circuitry as well as the input/output buffer circuitry including data line driver circuits insulating the memory cell array from external data lines and input/output control logic circuits insulating the address decoding logic circuitry and the data line driver circuits from external read/write control and strobe input sources. Both N-channel and P-channel MOSFETS are fabricated adjacent to one another as complementary pairs on the same "chip" with the exclusion of at least one guard ring diffusion region between adjacent drain diffusion regions of the complementary pairs by the inclusion of a relatively thick oxide layer (15–20 KA.) which operates to minimize internal interconnection line capacitance and parasitic surface channels. The data line drivers are bidirectional to provide nondestructive readout, fast readout response, noisy immunity and low-input capacitance. Each memory cell is comprised of two pairs of complementary MOSFETS coupled together as cross-coupled inverter circuits. Additionally, each cell is provided with a pair of parallely connected complementary MOSFETS acting as an input/output transmission switch and are coupled to a common input/output internal data line and operated by separate address command signals from the address decoding logic circuit. Another pair of parallely connected complementary MOSFETS are coupled to the memory cell as a feedback transmission switch and are operated by still other separate address command signals from the address decoding logic circuit. The address command logic utilized to operate the parallely connected pairs comprising the input/output transmission switch and the feedback transmission switch is timed to permit nondestructive readout of the memory cell.

3,641,512

INTEGRATED MNOS MEMORY ORGANIZATION

Dov Frohman-Bentchkowsky, Los Altos, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Apr. 6, 1970, Ser. No. 26,004
Int. Cl. G11c *5/02, 11/00*
U.S. Cl. 340—173 R **5 Claims**



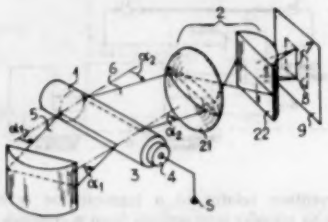
A semiconductor memory array consists of an array of MNOS transistors. Each transistor possesses an hystereris relationship between the gate voltage required to turn on the transistor and a previously applied gate voltage. Thus each MNOS transistor stores, by itself, one bit of information. A binary "1" is written into a transistor by applying a voltage of a first selected magnitude to the gate of the MNOS transistor while grounding its source and drain. Applying simultaneously a negative voltage to the drain of the MNOS transistor lowers the voltage across the dielectric beneath the MNOS transistor's gate electrode and prevents the storage of a binary "1." No electrical isolation is required between the MNOS transistors.

3,641,513

READOUT SYSTEM FOR MEMORIES COMPRISING MATRICES OF PHOTOSENSITIVE ELEMENTS

Jean Edgar Picquendar, and Roger Torguet, both of Paris, France, assignors to Thomson-CSF

Filed Aug. 4, 1970, Ser. No. 60,838
Claims priority, application France, Aug. 12, 1969, 69/27.692
Int. Cl. G11c *13/04, 11/42*
U.S. Cl. 340—173 LM **3 Claims**



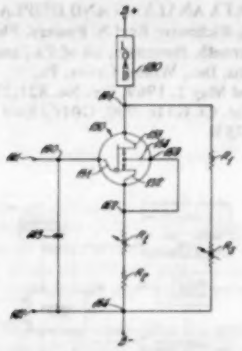
A readout system for memories comprises one or more matrices of photosensitive elements. An optical scanning system (3) produces a light beam with a scanning movement a lens system (21–22) transforms said beam into a beam which is flat perpendicularly to the plane of scan, and directs it onto a matrix of photosensitive elements (8) in the form of a line of light (7) covering a line of the matrix for each resolved point of the scanning function.

3,641,514

MEMORY SYSTEM

Vernon C. Rees, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation

Filed July 20, 1970, Ser. No. 64,015
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R **8 Claims**

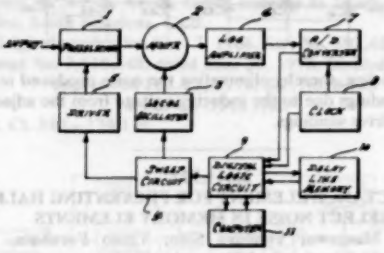


A memory unit comprising an electronic valve component having a very high-input impedance and including a control electrode and two output load electrodes. An input signal storage means is connected to the control electrode. An output means is connected between one of the output or load electrodes and a voltage supply. A zero adjustment impedance means is connected between that one of the output electrodes and the voltage supply to adjust current flow through the output means when no input signal is present. A span adjustment impedance means is connected between the other of the two output electrodes to regulate gain of the electronic valve independently of the zero adjustment impedance means. The electronic valve component is preferably a field effect transistor.

3,641,515
SPECTRUM ANALYZER

Lawrence B. Sues, Rome, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Sept. 10, 1970, Ser. No. 70,971
Int. Cl. G11c 21/00; G01r 23/02
U.S. Cl. 340—173 R 4 Claims

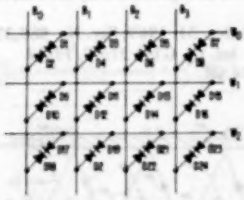


A spectrum analyzer is provided in which a digital recirculating delay line memory is used in conjunction with a swept receiver to effect a time variant signal across a frequency range of interest. The swept receiver is fed analog signals for subsequent analog to digital conversion. Thereafter, a logic circuit simultaneously associated with a delay line memory, sweep receiver circuit and computer receives the converted digital signals. The logic circuit and an analog to digital converter are simultaneously controlled by a common clock. The logic circuit synchronizes the receiver sweep to the recirculating memory and the digital recirculating memory stores in digital format for future utilization the spectral characteristics of the frequency range of interest.

3,641,516
WRITE ONCE READ ONLY STORE SEMICONDUCTOR MEMORY

Paul P. Castrucci, Poughkeepsie; Harlan R. Gates, Wappingers Falls; Robert A. Henle, Hyde Park; Wilbur David Pricer, Poughkeepsie; Robert M. Morton, Hopewell Junction; John W. Mason, and William D. North, both of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 15, 1969, Ser. No. 858,053
Int. Cl. G11c 11/36, 17/00
U.S. Cl. 340—173 SP 12 Claims

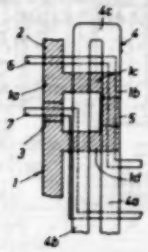


A read only memory having the capability of being written into once after manufacture. The cells of the memory are capable of being fused or permanently altered by directing a fusing current to the selected cells. The cell is a monolithic semiconductor device comprising a diode to be biased in a forward direction and a diode to be biased in the reverse direction structured so as to form back-to-back diodes. The reverse diode has a lower reverse breakdown voltage than the forward diode, and a metal connection, unconnected to any remaining circuit elements contacts the semiconductor device between diode junctions. The fusing current causes a metal-semiconductor alloy to form and short out the reverse diode.

3,641,517
SUPERCONDUCTIVE DATA STORAGE ARRANGEMENT

Michel Edmond Francis Brilman, Bruyeres-Le-Chatel; Jean-Pierre Alain Campagne, Antony, and Guy Georges Gorinas, Saint-Michel-sur-Orge, all of France, assignors to Societe Alsacienne de Constructions Atomiques de Telecommunications et d'Electronique "Alcatel", Paris, France

Filed Jan. 9, 1970, Ser. No. 1,604
Claims priority, application France, Jan. 9, 1969, 6900230
Int. Cl. G11c 11/44, 5/02
U.S. Cl. 340—173.1 10 Claims

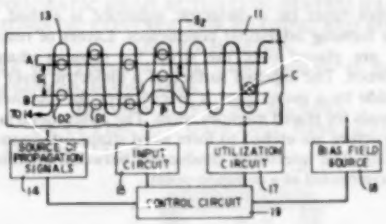


A superconductive device for the storage and the non-destructive reading of information or data, which has a minimum spatial requirement while assuring a practical and workable operation free from any parasitic signals including a storage arrangement having two portions which are positioned in close relationship with respect to each other, one of these portions providing a superconductive loop consisting of two superimposed layers of superconductive materials having different critical temperature points, one area thereof having one partially interrupted superconductive layer which allows this portion to readily lose the superconductive property thereof in the presence of a magnetic field, and the other portion also consisting of two superimposed semiconductive layers with one layer interrupted serving as a test conductor actuated by the field generated by the superconductive loop and a readout conductor.

3,641,518
MAGNETIC DOMAIN LOGIC ARRANGEMENT

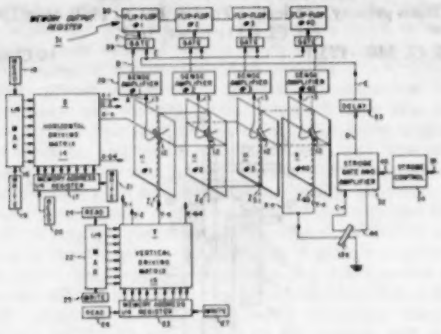
John Alexander Copeland, III, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 30, 1970, Ser. No. 76,883
Int. Cl. G11c 19/00, 11/14
U.S. Cl. 340—174 TF 6 Claims



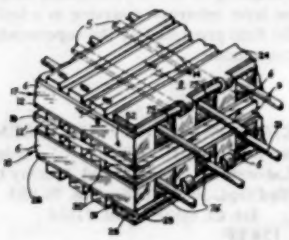
A single wall domain logic circuit arrangement is realized by a pair of magnetically soft rails on the surface of a material in which domains can be moved. The distance between the rails is reduced over a prescribed portion of the rails to define a position at which domains moving along both rails interact.

3,641,519
MEMORY SYSTEM
Albert H. Ashley, Bedford, Mass., assignor to Sylvania Electric Products Inc., Wilmington, Del.
Filed Apr. 10, 1958, Ser. No. 727,602
Int. Cl. G11c 7/02, 11/06
U.S. Cl. 340—174 RC 18 Claims



A ferrite-core memory system employing a specimen magnetic core or memory device, having the same operating characteristics as the memory elements, to generate the requisite strobe pulses for addressing the memory.

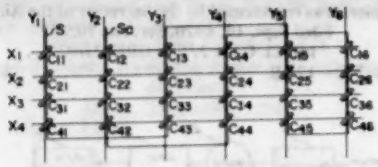
3,641,520
INTERSTITIAL CONDUCTORS BETWEEN PLATED MEMORY WIRES
Joseph M. Shaheen, La Habra, and John Simone, Garden Grove, both of Calif., assignors to North American Rockwell Corporation
Filed June 12, 1970, Ser. No. 45,677
Int. Cl. G11c 5/04, 11/04, 11/14
U.S. Cl. 340—174 PW 5 Claims



A copper layer on a dielectric substrate is etched into strips for forming interstitial conductors. Layers of resinous material are placed over the strips for forming channels therebetween. The exposed surface of a dielectric layer clad on one side by a metal layer is placed over the channels to form tunnels for plated memory wires. The outer metal layers of the structure are etched to form word straps orthogonal to the tunnels. The interstitial conductors between the tunnels are interconnected at a common point.

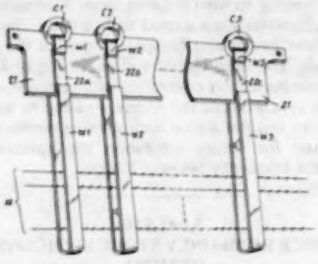
3,641,521
MAGNETIC-CORE MEMORY MATRIX
Joichiro Ezaki, Chiba-ken, Japan, assignor to TDK Electronics Company Ltd., Tokyo, Japan
Filed Aug. 25, 1969, Ser. No. 852,809
Claims priority, application Japan, Aug. 30, 1968, 43/74828
Int. Cl. G11c 5/02, 11/06
U.S. Cl. 340—174 BA 1 Claim

A magnetic-core memory matrix formed in such a manner that the spacing between the adjacent drive windings parallel with the sense winding is made larger than the spacing between the adjacent drive windings not parallel with the



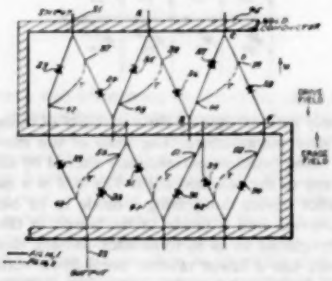
sense winding, thereby eliminating the noise produced in the sense windings due to the inducing voltage from the adjacent parallel drive windings.

3,641,522
INDUCTANCE ELEMENT FOR PREVENTING HALF-SELECT NOISE IN MEMORY ELEMENTS
Harumi Maegawa; Yohihiro Sato; Yasuo Furuhata, and Takayuki Kiumi, all of Kawasaki-shi, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Nov. 14, 1969, Ser. No. 876,772
Claims priority, application Japan, Nov. 16, 1968, 43/83898
Int. Cl. G11c 7/02, 5/08
U.S. Cl. 340—174 M 4 Claims



Each of a plurality of magnetic wires has a conductor covered by ferromagnetic material. The magnetic wires are equidistantly spaced from each other in parallel relation and are affixed to each other by electrical insulating material interposed therebetween.

3,641,523
MAGNETIC DOMAIN CIRCULATING SHIFT REGISTER
Harvey I. Jauvtis, Belmont, Mass., assignor to The United States of America as represented by the Secretary of the Air Force
Filed Dec. 31, 1969, Ser. No. 889,371
Int. Cl. G11c 21/00, 11/14
U.S. Cl. 340—174 SR 3 Claims



A magnetic domain circulating shift register in which magnetic channels are in a continuous zigzag configuration and magnetic domain diodes are positioned in each channel branch to obtain single direction of propagation. Fan outs

from alternating branch channels through a film-to-film transfer junction into a second film inhibit propagation in adjacent branch channels while an interlacing hold conductor permits selective erasure.

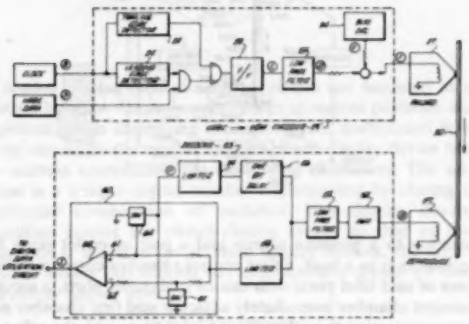
3,641,524
MAGNETIC RECORD AND REPRODUCE SYSTEM FOR DIGITAL DATA HAVING A NRZC FORMAT

Kermit A. Norris, Azusa, Calif., assignor to Leach Corporation, South Pasadena, Calif.

Original application Nov. 7, 1966, Ser. No. 592,458, now Patent No. 3,518,648, dated June 30, 1970. Divided and this application Feb. 13, 1970, Ser. No. 8,123

Int. Cl. G11b *5/02*

U.S. Cl. 340—174.1 H **7 Claims**



Apparatus for recording and reproducing digital data on a magnetic medium is disclosed. The apparatus operates to convert data in a NRZC format to a NRZ–S format and then to a SϕM format for recordation. Reproduced signals are reconverted from the SϕM format to a NRZ–S format. The reproduced signals are then filtered and threshold detected to derive the original data in NRZC format.

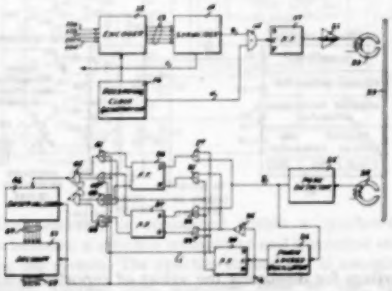
3,641,525
SELF-CLOCKING FIVE BIT RECORD-PLAYBACK SYSTEM

Gene E. Milligan, Torrance, Calif., assignor to The National Cash Register Company, Dayton, Ohio

Filed Aug. 17, 1970, Ser. No. 64,355

Int. Cl. G11b *5/06*

U.S. Cl. 340—174.1 G **10 Claims**



A magnetic recording and reproducing system wherein a parallel four-bit input code is converted into a five-bit character code and magnetically recorded. The code has a low redundancy when recorded with a magnetic state changing only for each zero bit. As a result, the magnetic recording has a high-bit density. Upon reading the magnetic recording, the zero-bit pulses are employed to synchronize a phase lock oscillator, enabling self-clocking as in the Manchester recording system. The recorded five-bit code is recovered by applying the read pulses and the phase lock oscillator output to logic circuits including flip-flops and gates. The five serial bit character is parallelized and decoded to recover the original five-bit code.

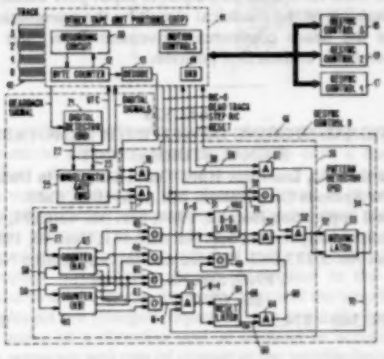
3,641,526
INTRA-RECORD RESYNCHRONIZATION

David L. Bailey, Longmont, and Harry C. Hinz, Jr., Arvada, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,595

Int. Cl. G11b *5/02*

U.S. Cl. 340—174.1 A **19 Claims**



A self-clocking recording system using signals representative of data having predetermined one-half wavelength sequences including short and long one-half wavelengths. Resynchronization (resync) and position indicating signals are recorded among data signals in each track for indicating track position with respect to other tracks. Frequency synchronization utilizes recorded data signals. The position-indicating resync signal is limited in length to a small number of cycles of record state changes which primarily use the longer one-half wavelengths used to record data. In one recording scheme, two long wavelengths of the same polarity indicate position in the tracks. In another, two successive long one-half wavelengths indicate track position and data phase relationships. In yet other recording schemes, a unique sequence of two one-half wavelengths or a sequence of three long one-half wavelengths indicates data phase and track positional information.

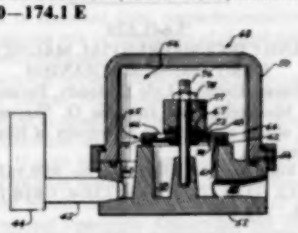
3,641,527
PNEUMATIC HEAD-ACTUATING SYSTEM HAVING AUTOMATIC CONTROL FOR READING AND WRITING THROUGH HEADS

Ko Ko Gyi, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 9, 1970, Ser. No. 9,807

Int. Cl. F16k *7/17*; **G11b** *15/12*; **H01h** *35/24*

U.S. Cl. 340—174.1 E **15 Claims**



A pneumatic system for controlling the relative position of electromagnetic heads with respect to a magnetic disc

recording surface. A source of fluid pressure is supplied through a first valve means to the input port of a pressure regulator and to the input port of a second valve means. Pressure emanating from the output port of the regulator is applied to electromagnetic heads which causes them to move from a first to a second position relative to the magnetic disc surface. Pressure emanating from the output port of the second valve means is supplied to a pneumatic switch for enabling or disabling electrical circuit means which reads or writes information from the magnetic recording disc through the magnetic heads. The second valve means has a first time delay corresponding to the rate of fluid flow from its input to output port which insures the enabling of the electrical circuit by the pneumatic switch only after the heads have moved into their second position, and has a second time delay, shorter than the first time delay, corresponding to the rate of fluid flow from its output to input port which insures the disabling of the electrical circuit by the pneumatic switch before the heads commence movement from their second position back to their first position.

3,641,528

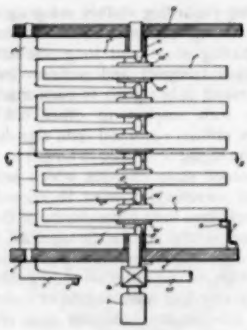
SIGNAL-STORING DEVICE WITH REMOVABLE SIGNAL-STORING UNIT

Gerhard Dirks, Los Altos Hills, Calif., assignor to Dirks Computer Systems Corporation, Los Altos Hills, Calif.

Original application Dec. 22, 1964, Ser. No. 420,294, which is a division of application Ser. No. 627,441, Dec. 10, 1956, now Patent No. 3,172,082. Divided and this application Nov. 14, 1969, Ser. No. 876,840

Int. Cl. G11b *25/00*

U.S. Cl. 340—174.1 C **5 Claims**



A selective signal storage device which includes a signal-storing unit composed of a supporting shaft and a plurality of disks having signal-storing surfaces on at least one face thereof and being secured axially spaced from each other to the shaft for rotation therewith. Releasable coupling means are provided to releasably couple the supporting shaft to drive means so that the signal-storing unit can be removed as a unit from the remainder of the device.

3,641,529

RADIAL AND CIRCUMFERENTIAL MAGNETIC HEAD POSITIONING MECHANISM

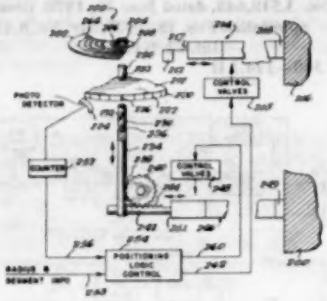
Donald L. Bitzer, Urbana; Lyle E. Bandy, Decatur; Roger L. Johnson, Monticello, and Dominic O. Skaperdas, Champaign, all of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Aug. 18, 1969, Ser. No. 850,965

Int. Cl. G11b *17/02*; **A63d** *15/04*; **G01d** *15/28*

U.S. Cl. 340—174.1 C **12 Claims**

Random access information retrieval apparatus for selecting a particular item from a plurality thereof including an improved pair of *x*–*y* coordinate digitally positionable devices which are driven by a four-way control valve. A polar coordinate random access information retrieval apparatus including a rotatable recording disc having information recorded on at least one surface thereof, a transducer for detecting said information, radial positioning means for moving said transducer radially along said disc, and angular positioning means coupled to said recording disc for incrementally rotating said disc to position desired information on said disc adjacent said transducer. An improved four-way control valve including a valve housing having a pair of inlet ports for connection to a pressure source and a pair of outlet ports for connection to a load, a first control chamber communicating one of said inlet ports with one of said outlet ports, a second control chamber immediately adjacent said first chamber and communicating the other of said inlet ports with the other of said outlet ports, a diaphragm intermediate said first and second chambers and forming a common wall therebetween, and a diaphragm control means for moving said diaphragm to selectively seal one of said inlet ports in said respective first and second chambers to control the fluid flow between said inlet and outlet ports.



3,641,530

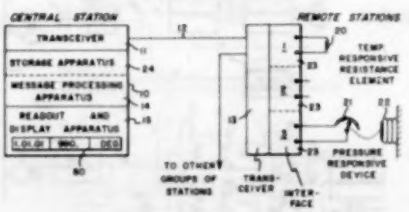
SYSTEM FOR DISPLAYING VALUES OF CONDITIONS REPORTED AT A CENTRAL STATION FROM VARIOUS REMOTE STATIONS OF A BUILDING AIR CONDITION SYSTEM

Frank H. W. Schoenwitz, Schaumburg, Ill., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed July 13, 1970, Ser. No. 54,174

Int. Cl. G08c *19/04*, *15/12*

U.S. Cl. 340—183 **8 Claims**

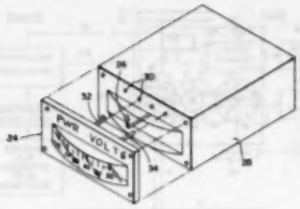


A system for displaying the values of reported conditions of a building air-conditioning system wherein a reporting message from a remote station has a first portion for selecting the engineering units for the normalized condition value reported in a second portion of the message so that upon the message being received at a central station the first portion of the message is used to retrieve from a memory the engineering unit data to be applied to the normalized condition value to report the condition as a true reported value.

3,641,531
CHANGEABLE ADDRESS DISPLAY DEVICE

Robert Alan Heartz, Deland, Fla., assignor to General Electric Company

Filed Dec. 30, 1970, Ser. No. 102,655
Int. Cl. G08c 15/00
U.S. Cl. 340—184 3 Claims

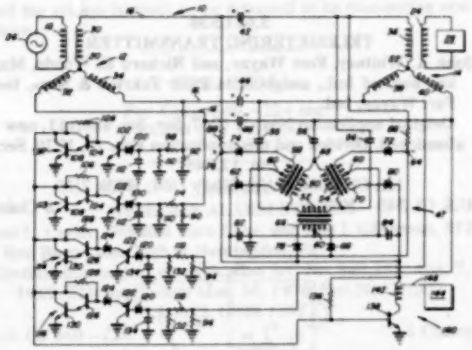


Analog display devices such as meters are mounted at a central location. Measurements taken at remote positions are digitized, given identifying characters, and multiplexed in a serial stream to the central location. Each display device has an address constituting the identifying characters. The address is a unique digital number implemented by closing a particular combination of switches. The display device faceplate carries the switch-closing means so that as the faceplate is mounted on different display devices, the information having that address will automatically appear on that particular display device.

3,641,532
FAULT MONITOR FOR USE WITHIN A SYNCHRO-TORQUE SYSTEM

Hugh P. McAdams, Jr., Drexel Hill, Pa., assignor to Litton Precision Products, Inc., Beverly Hills, Calif.

Filed Jan. 26, 1970, Ser. No. 5,768
Int. Cl. G08c 19/00
U.S. Cl. 340—198 5 Claims

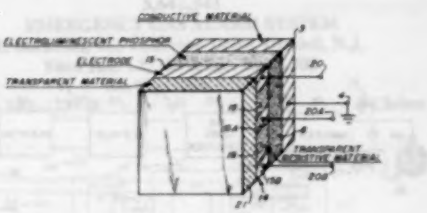


A fault monitor is connected within a synchro-torque system between a synchro transmitter and a synchro receiver forming the system. The synchro transmitter is energized by alternating current that transmits data to the synchro receiver over electrical conductors to which the fault monitor is connected for receiving energizing alternating current. The monitor passes generated direct current through the synchro transmitter and receiver and applies the current to monitoring switches connected to a warning device. The warning device is energized in the absence of the direct current for indicating a fault condition within the synchro-torque system.

3,641,533
SOLID-STATE ELECTROLUMINESCENT MOVING DISPLAY DEVICE

Frederick B. Sylvander, Rutherford, N.J., assignor to The Bendix Corporation

Filed June 26, 1969, Ser. No. 836,704
Int. Cl. G08c 19/38
U.S. Cl. 340—198 5 Claims

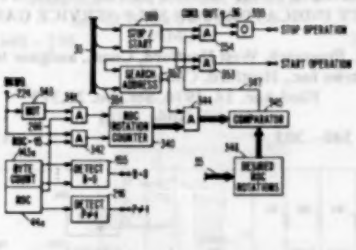


A device for providing a moving display having an electroluminescent phosphor layer arranged to emit a band of light when alternating current voltages of different amplitudes are applied across the phosphor layer. A layer having a plurality of electrodes separated by transparent resistive material is positioned at one side of the phosphor layer and a common electrode layer is positioned at the opposite side of the phosphor layer. The voltages are applied to the electrodes and to the common electrode layer and the amplitudes of the voltages are changed sequentially to cause the band of light to move in a direction and at a speed in accordance with the sequence and rate of change in the amplitudes of the voltages.

3,641,534
INTRARECORD RESYNCHRONIZATION IN DIGITAL-RECORDING SYSTEMS

John W. Irwin, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,766
Int. Cl. G11b 5/02
U.S. Cl. 340—174.1 A 59 Claims

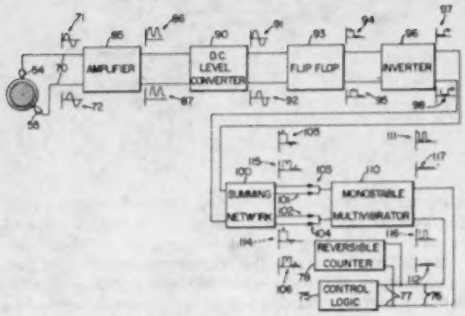


In a block of recorded data, resynchronization signals are interleaved among sets or subblocks of digital data signals for enabling reestablishment of self-clocking in a dead track. Resynchronization occurs within a block of recorded data. In a multitrack system, requeuing the dead track in the skew buffers (SKB) is accomplished by placing the dead track SKB position at maximum leading relationship to the most lagging active track. If data signals from the previously dead track are received by SKB before the dead track has reached maximum lagging relationship, the previous dead track is activated for normal operation. Otherwise, the dead track is returned to dead-tracking status. The readout counter (ROC) of SKB controls read-back operations and determines signal format on the record media.

3,641,535
POSITIONING APPARATUS EMPLOYING A MAGNETIZED SCREW THREAD

George S. Knopf, Dayton, Ohio, assignor to The Bendix Corporation

Filed May 13, 1969, Ser. No. 824,243
Int. Cl. G08c 19/00
U.S. Cl. 340—195 19 Claims

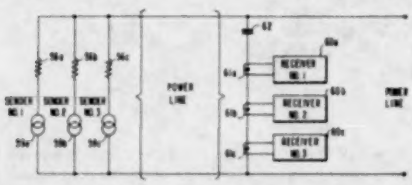


A positioning apparatus, and method of making same, having two relatively movable members with one of the members having detectable means thereon and the other having reading head means capable of detecting the detectable means whereby such apparatus is capable of precisely relatively moving its members and indicating both the magnitude and direction of movement of one member with respect to the other.

3,641,536
GASOLINE PUMP MULTIPLEXER SYSTEM FOR REMOTE INDICATORS FOR SELF-SERVICE GASOLINE PUMPS

Frank B. Prosprich, West Hartford, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Apr. 14, 1970, Ser. No. 28,379
Int. Cl. G08c 19/16
U.S. Cl. 340—203 15 Claims

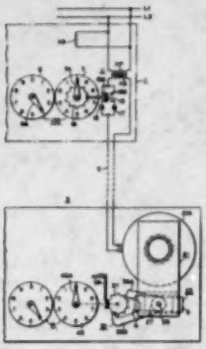


A multiplexer system employing a form of pulse width modulation and detection. The system is particularly adapted to use in a telemetering system for remote indicators. The system operates in connection with a self-service gasoline pump and transmits via a 60 Hz. powerline gallons and dollars information. A modified form of the system transmits only dollars or only gallons information for a plurality of pumps. The system can be further adapted for inventory control purposes. Variants include signal forcing and totalizing circuits for a plurality of independent information sources providing absolute accuracy.

3,641,537
METERING SYSTEM HAVING A REMOTE REGISTER

Emil deCoudres Hoffman, Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 16, 1969, Ser. No. 816,503
Int. Cl. G08c 19/16
U.S. Cl. 340—205 4 Claims

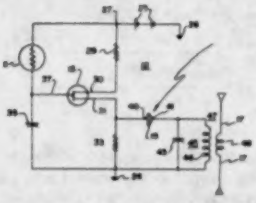


Information is transmitted from a meter to a remote register. At the meter a transmitter is provided which generates two groups of unidirectional pulses having different polarities. The changes from a group of one polarity to a group of another polarity occur at a rate dependent on a variable quantity being measured. The pulses are transmitted to the remote register for application to an electromagnet which develops a magnetic field having a direction dependent on the polarity of the pulses. A polarized magnetic armature disposed in the field oscillates a pawl at a rate dependent on the rate of change in the direction of the magnetic field. The pawl actuates indicators which form part of the remote register.

3,641,538
TELEMETERING TRANSMITTER

John A. Whitney, Fort Wayne, and Richard E. Woods, Markle, both of Ind., assignors to Peter Eckrich & Sons, Inc., Fort Wayne, Ind.

Original application Nov. 2, 1967, Ser. No. 680,111, now abandoned. Divided and this application Feb. 18, 1970, Ser. No. 12,348
Int. Cl. G08c 19/18; H04b 1/04; H03k 7/10
U.S. Cl. 340—208 8 Claims



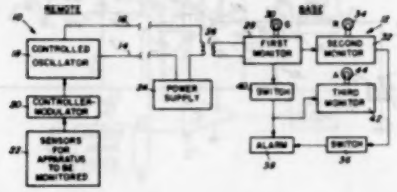
A temperature sensor in circuit with a unijunction transistor drives a tunnel diode FM transmitter for generating discontinuous bursts of a frequency modulated oscillatory output signal. The transmitter is mounted within a unitary housing which is conveyed along with linked meat products whose internal temperature is being monitored.

3,641,539

REMOTE MONITORING AND CONTROL SYSTEM

John C. Lesher, Erie, Pa., assignor to James Barber, Erie, Pa., a part interest

Filed Dec. 23, 1968, Ser. No. 786,316
Int. Cl. G08b 29/00, 19/00
U.S. Cl. 340—123.1 24 Claims



A system is disclosed which is capable of monitoring the condition of an apparatus, generating signals indicative of that condition, and, at a remote location, providing signals indicative of the detected status. The remote unit comprises a controllable oscillator which produces a signal which may be pulsed, or modulated, to represent data to be sent to the base station. The base unit includes three monitoring circuits responsive to the pulse rate of the data signals to provide positive readings of the status of the device being monitored. The first monitoring circuit represents a rest condition at the remote station when in a first state of energization, and indicates an alarm, or fault, condition when in a second state of energization, for example. In this second state, the second monitoring network is also energized to provide a positive indication of the alarm. The third monitoring circuit is a self-surveillance circuit which becomes energized when the telemetering network malfunctions. By energizing the monitoring networks in various combinations, additional information concerning the remote station can be derived. Audible alarm means are provided in conjunction with the monitoring networks to indicate a fault condition at the remote unit. Switching means are provided to turn the audible alarm off during the time that the fault condition is being corrected, the alarm again sounding when corrections have been made and the system is ready to be returned to its monitoring condition.

ERRATUM

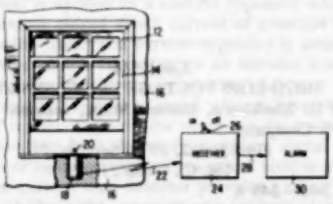
For Class 340—224 see:
Patent No. 3,641,425

3,641,540

WIRELESS ALARM SYSTEM

Joel L. Cutler, 798 Red Barn Lane, and Joel I. Glickman, 812 Red Barn Lane, both of Huntingdon, Pa.

Continuation-in-part of application Ser. No. 848,258, Aug. 7, 1969. This application Mar. 30, 1970, Ser. No. 23,577
Int. Cl. G08b 1/08
U.S. Cl. 340—224 6 Claims



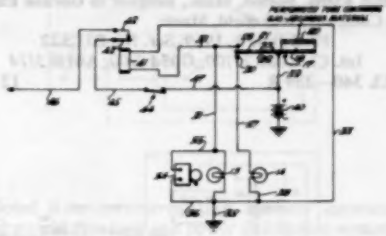
A double-hung window mounted alarm actuating unit comprises a transmitter for generating wireless signals, a relative constant voltage power source connected to the transmitter, and switch means mounted to the bottom and top windows operable upon the opening of either the bottom or top window for actuating the transmitter to generate a wireless signal for a relatively short period, whereby the transmitter draws power from the power source only during the relatively short period. Switch means closing for relatively short period via magnetic decoupling of spring biased armature.

3,641,541

EMERGENCY GAS ALARM SYSTEM

James R. Borkhuis, 485 Lakeview Drive, Oradell, N.J.

Filed Jan. 12, 1970, Ser. No. 2,203
Int. Cl. G08b 21/00
U.S. Cl. 340—237 R 8 Claims



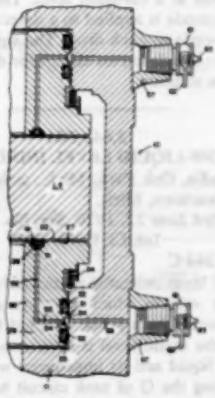
A gas alarm system utilizing a gas absorber cartridge having a high affinity to the desired gas to be detected and a balance scale supporting the gas absorber container at one side and an adjustable counterweight of the other side, is described. Imbalance of the scale due to gas absorption in the gas absorber cartridge actuates an electrical switch in an alarm circuit to energize visual and audible signals indicative of gas in the surrounding atmosphere.

3,641,542

VALVE APPARATUS HAVING LEAK-DETECTING MEANS

Marvin H. Grove; Kee W. Kim, and Lyle R. Van Arsdale, all of Houston, Tex., assignors to M & J Valve Company, Houston, Tex.

Filed Mar. 19, 1970, Ser. No. 21,074
Int. Cl. F16k 25/00, 37/00
U.S. Cl. 340—238 5 Claims



Apparatus making use of at least one main flow control valve and having means for determining whether or not the

valve is leaking. The valve employs a sealing assembly which seals with respect to the valve working surface of the valve member (e.g., gate) on two spaced concentric areas. Duct means serves to establish communication between the space between the sealing areas and the exterior of the valve. In the event of leakage past the sealing assembly, it can be detected by noting any discharge of fluid through the duct means to the exterior of the valve. In one embodiment the leakage is noted by opening a vent valve adjacent the main valve. In another embodiment the valve can be checked for leakage at a remote station.

3,641,543

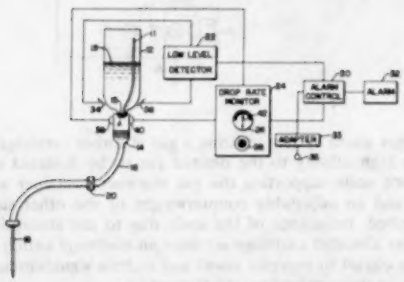
LOW-LEVEL DETECTOR AND DROP RATE MONITOR, PARTICULARLY FOR INTRAVENOUS FEEDING APPARATUS

Sherman Rigby, Boston, Mass., assignor to Gordon Engineering Company, Wakefield, Mass.

Filed June 9, 1969, Ser. No. 831,522

Int. Cl. G08b *21/00*; **G05d** *7/00*; **A61m** *5/14*

U.S. Cl. 340—239 R **12 Claims**



In a low-level detector, a capacitance is established between an active electrode and grounded electrode as a function of a solution level in a container. A detector, which is periodically clamped to ground at a rate specified by a multivibrator, is operatively connected to the active electrode. The capacitance between the electrodes, which represents the solution level, is sensed in the detector. In a drop rate monitor, a signal from a multivibrator is applied to a first electrode and is capacitively coupled to a second electrode when a solution drop in a chamber appears therebetween. A stabilizing loop maintains the signal at the second electrode at a constant level. The coupled signal at the second electrode is applied to a detector which generates a signal in response to each drop. The signal from the detector is applied to a tachometer circuit for determination of the drop rate of the solution.

3,641,544

LOW-LIQUID LEVEL INDICATOR

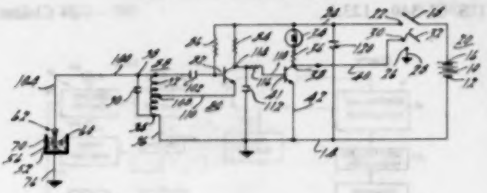
Bernard G. Radin, Oak Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 22, 1970, Ser. No. 48,218

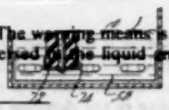
Int. Cl. G08b *7/00*

U.S. Cl. 340—244 C **6 Claims**

A low-liquid level indicator particularly adapted for use in an automotive vehicle which employs an oscillator whose tank coil is shunted by a probe adapted to be immersed in a liquid. When the liquid level is satisfactory, the probe is immersed in the liquid and its impedance will be relatively low thereby reducing the Q of tank circuit to a value where no oscillations will be produced. When the liquid level falls to an unsatisfactory level, the probe will no longer be immersed in the liquid, and its impedance will be increased sharply thereby resulting in oscillations being produced by the oscillator. This change, between the nonoscillatory and the oscillatory states, is sensed by a solid-state switching network which controls the energization of a warning means,



preferably in the form of a lamp. The warning means is energized when the probe is not immersed in the liquid and the oscillator is in an oscillatory state.



3,641,545

DEVICE FOR INDICATING INTERRUPTED ELECTRIC SERVICE

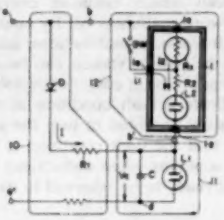
Takaaki Okada, Ageo-shi, Japan, assignor to Kabushiki Kaisha Koparu

Filed Dec. 3, 1969, Ser. No. 881,711

Claims priority, application Japan, Dec. 9, 1968, 43/107246

Int. Cl. G08b *21/00*

U.S. Cl. 340—248 B **6 Claims**



A device having neon lamps for indicating an interruption of AC service. One of the neon lamps remains to be dark for the initial service period prior to an interruption and also for the subsequent interruption period, but it automatically begins to flicker in a predetermined cycle upon the resumption of service following the interruption. If necessary, another neon lamp adapted to be lighted up only for the period of the initial service may be utilized as the pilot lamp for indicating the initial service period. The distinguishment of the initial service period from the resumed service period is undertaken by an impedance-retaining circuit which utilizes a combination of a photoconductive element and a neon lamp.

3,641,546

HIGH-LOW VOLTAGE LEVEL SENSOR

Richard D. Blackburn, Dalton, Mass., assignor to General Electric Company

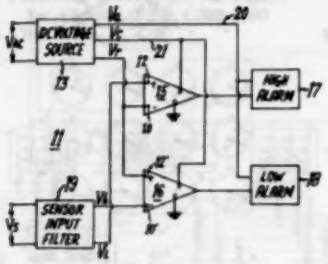
Filed Jan. 2, 1970, Ser. No. 47

Int. Cl. G08b *21/00*

U.S. Cl. 340—248 A **6 Claims**

High- and low-level voltages are derived from a voltage to be monitored and applied, along with a reference voltage, to the input terminals of a pair of comparators. An over voltage condition causes the comparator monitoring the low-level

voltage to be energized, while an under voltage condition results in the energization of the comparator monitoring the



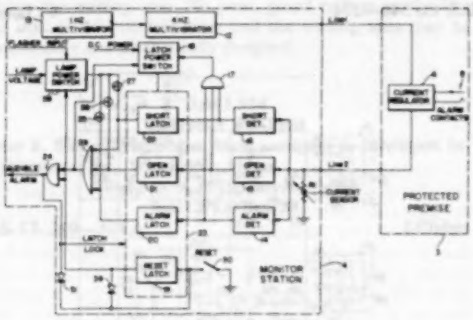
higher level voltage. The signal then produced by the comparators is used to energize an alarm device.

3,641,547

LINE SECURITY SYSTEM

Martin H. Reiss, Newton, and William L. Cotter, Beverly, both of Mass., assignors to Alarmtronics Engineering, Inc., Newton, Mass.

Filed May 25, 1970, Ser. No. 40,285
Int. Cl. G08b *13/22*
U.S. Cl. 340—253 R **3 Claims**



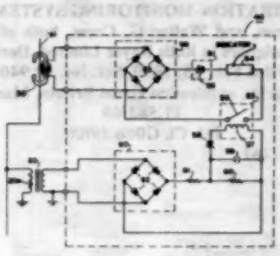
A system for insuring the security of electrical transmission lines extending between a monitor station and a remote station utilizes a voltage source at the monitor station which impresses an AC voltage signal on the transmission lines. At the remote station, the AC voltage signal is rectified and the rectified signal is applied to a current regulator which provides a quiescent pulsed direct current of constant level to the transmission lines. The current regulator is arranged to provide a higher alarm current when an intruder is detected at the remote station. At the monitoring station, a shorted line fault detector provides a signal when a reversal in the direction of normal current flow occurs in the transmission lines, an open line fault detector provides a signal when a drop in current below the quiescent current level is detected, and an alarm current fault detector provides a signal when a rise in current above the quiescent current level is detected. The impressed voltage is periodically reduced in amplitude to a level which barely sustains the minimum quiescent current level to test line impedance.

3,641,548

OVERCURRENT-FAULT INDICATOR APPARATUS FOR TRUNK LINES OF AN ELECTRICAL POWER DISTRIBUTION SYSTEM

Larry A. Groce, Route 2, Box 575, Arlington, Tex.

Continuation-in-part of application Ser. No. 780,541, Dec. 2, 1968, now abandoned. This application Feb. 17, 1969, Ser. No. 799,621
Int. Cl. G08b *21/00*
U.S. Cl. 340—253 A **5 Claims**



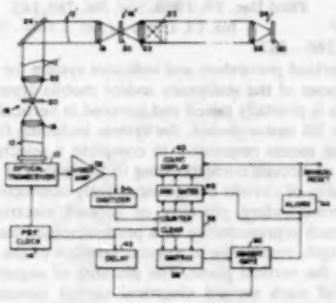
Disclosed is an overcurrent-fault indicator apparatus for locating a trunk line fault in a power distribution system. The apparatus includes a pair of input terminals adapted to be connected with the primary and secondary of a power distribution transformer, first and second switches which may be a zener diode and reed-type contact, respectively, coupled to the first input terminal through a full wave rectifier, indicating display means which is actuated by the closing of the first and second switch, and second switch closing means coupled to the other input terminal for closing said second switch, this closing means including time delay circuitry provided by a resistor and capacitor for temporarily delaying the opening and closing of the reed switch.

3,641,549

ELECTRO-OPTICAL PERIMETER INTRUSION ALARM

Victor A. Misek, Hudson, N.H., and Robert Myers, Chelmsford, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed June 25, 1970, Ser. No. 49,794
Int. Cl. G08b *13/00*
U.S. Cl. 340—258 B **14 Claims**



An electro-optical perimeter intrusion alarm system wherein a pulsed beam of collimated optical energy from a transceiver is directed sequentially to a plurality of partially retroreflective stations. Each station may have an additional

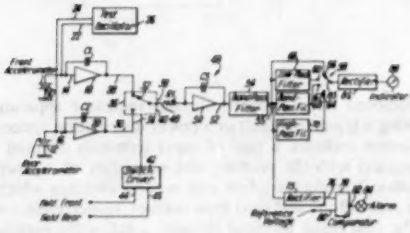
reflector for directing energy transmitted by that station in a desired direction to enclose a perimeter with a beam or beams of energy. An intruder interrupting the beam blocks the pulsed energy which would otherwise be returned to the transceiver by any retroreflectors further along the perimeter. The area between stations which is crossed by an intruder is determinable from the characteristics of the energy retroreflected by the plurality of partially retroreflective stations.

3,641,550

VIBRATION-MONITORING SYSTEMS

Derek L. Lynas, and Walter G. Cross, both of Mickleover, England, assignors to Rolls Royce Limited, Derby, England

Filed Feb. 25, 1970, Ser. No. 13,940
Claims priority, application Great Britain, Mar. 5, 1969, 11,582/69
Int. Cl. G08b *19/00*
U.S. Cl. 340—261 **10 Claims**



A vibration-monitoring system for use with a three-shaft gas turbine engine. Vibration from the engine is picked up by two electrical transducers and transmitted to a filter network. The filters produce three electrical outputs in three separate frequency bands, each of which corresponds to the frequency band of the vibration produced by a respective one of the shafts. The vibration produced by each shaft can thus be separately indicated.

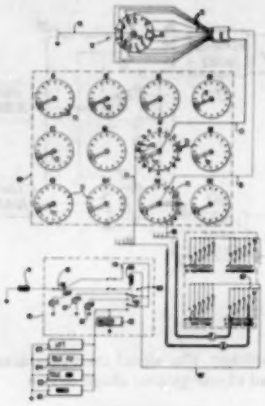
3,641,551

SAFE LOAD CONTROL SYSTEM FOR TELESCOPIC CRANE BOOMS

Russell L. Sterner, Greencastle, Pa., and William L. Lowe, Hagerstown, Md., assignors to Grove Manufacturing Company, Shady Grove, Pa.

Filed Dec. 19, 1968, Ser. No. 785,145
Int. Cl. G08b *21/00*
U.S. Cl. 340—267 **18 Claims**

An overload prevention and indicator system for telescopic boom cranes of the stationary and/or mobile types in which the boom is pivotally raised and lowered in vertical planes by hydraulic lift motor means, the system including first electrical circuit means responsive to complete a selected on of a plurality of circuits corresponding to the length of the boom, the plurality of circuits being respectively connected in series to a corresponding plurality of second electrical circuit means, each representative of a predetermined increment of boom length, responsive to angular position of the telescopic boom in the vertical plane. The plurality of angular position outputs of each second electrical circuit means are connected according to predetermined crane overload information to a plurality of third circuit means representative of pressure range increments, and a pressure switch responsive to fluid pressure in the lift motor means, which is indicative of boom load, is connected to successively operate said third circuit means as the fluid pressure in said lift motor means increases and actuate an indicator and render inoperative selected operations of the crane when the crane approaches an overload or tipping condition at the particular length,



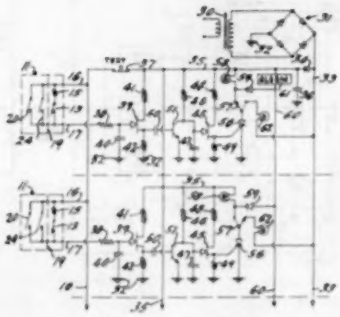
angle and load condition at which it is operating at any instant.

3,641,552

CENTRALLY LOCATED ACCESS ALARM SYSTEM

Nelson A. Friberg, Toledo, Ohio, assignor to International Assemblix Corporation, Toledo, Ohio

Filed Feb. 18, 1970, Ser. No. 12,401
Int. Cl. G08b *13/22*
U.S. Cl. 340—274 **9 Claims**



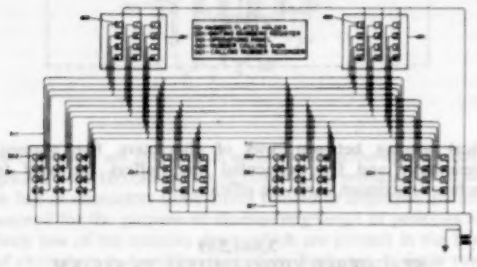
Apparatus for monitoring a plurality of remotely located doors or conditions in a building. A separate sensor is positioned adjacent each door or at each location at which a condition is sensed. Each sensor or group of connected sensors has a resistor which is connected to a centrally located detector circuit by means of a separate pair of electrical conductors. Each sensor includes means for disconnecting the resistor from the connected pair of conductors either when the adjacent door is open, when some other monitored condition is sensed, or when the sensor is tampered with. The detector circuit includes two relaxation oscillators. The resistor in one or more sensors forms a portion of an RC timing circuit in a first of the oscillators. A change in the resistance in the sensor changes the operating frequency of the first oscillator to cause the second oscillator to cycle and trigger an alarm.

3,641,553

REGISTERING AND CALLING SYSTEM FOR WAITING NUMBERS

Dicksen T. W. Lau, 450 17th Ave., San Francisco, Calif.

Filed May 4, 1970, Ser. No. 34,039
Int. Cl. G07c 9/00; G08b 5/00
U.S. Cl. 340—286 9 Claims



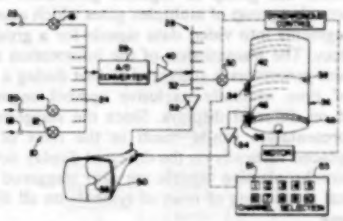
A unified system for recording the presence of patrons in a waiting area, registering the total number of such patrons to enter said waiting area, and notifying said patrons of the availability of servicing facilities consecutively, in the order of their arrival in said waiting area. Until such time as a patron is called to an available servicing facility, there is no requirement to wait in a particular regimented position within the waiting area. No pens, guard railings or the like are utilized to maintain lines and the waiting area may be comfortably and aesthetically designed.

3,641,554

DISPLAY SYSTEM

Peter E. Slavin, Winchester, Mass., assignor to Intelligent Instruments, Inc., Winchester, Mass.

Filed Jan. 9, 1970, Ser. No. 1,584
Int. Cl. G08b 5/22
U.S. Cl. 340—324 A 2 Claims



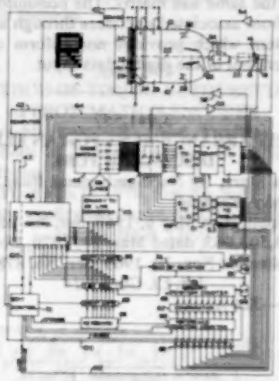
Analog data from a number of sources are converted to digital form and stored in a memory unit having a plurality of channels. Any channel of digital data may be retrieved selectively and converted back into analog form to operate a cathode-ray tube which will graphically display the original data as a trace, the deflection in one direction representing the magnitude of the quantity and the deflection in the other direction representing time.

3,641,555

COMPUTER TERMINAL APPARATUS

John R. Griffin, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 9, 1968, Ser. No. 782,254
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A 18 Claims



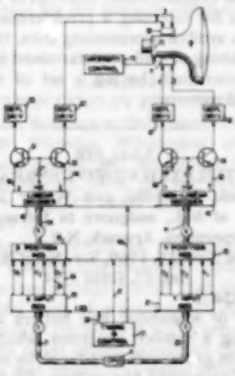
A computer terminal, e.g., for communicating with a remote computer via a telephone link, includes a bistable cathode-ray storage tube having a split screen comprising first and second storage portions, and an input device such as a keyboard for writing a line of information on a first portion of the tube target. A shift register is employed for digitally storing a line of information inserted therein from a local keyboard. The same line of information is written on a first portion of the target from the shift register. This line of information is selectively correctable by inserting corrections in the shift register, erasing the first portion of the target, and rewriting the contents of the shift register. The corrected line may then be transmitted from the shift register to the distant computer, and a plurality of lines of information are written on the second portion of the cathode-ray tube split-screen target from the computer. Each corrected line may be added to computer storage and displayed on the second part of the split-screen target.

3,641,556

CHARACTER ADDRESSING SYSTEM

Richard A. Jones, Red Hook, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1969, Ser. No. 837,790
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A 6 Claims



In a cathode-ray tube display, digital signals representative of characters to be generated are divided into two groups

representing the two directions of deflection. A first group provides a linear region in which uniform deflection steps are generated for each signal increment, while a second group provides a nonlinear region in which varied deflection increments are generated for each signal increment. The nonuniform regions provide higher resolution in those areas where curves normally occur and less resolution in the remaining areas thus providing higher character resolution in specified positions on the same size matrix. The nonuniform deflection is obtained from associated decoders through a weighted addressing system which provides nonuniform current increments independent of the digital data input.

3,641,557

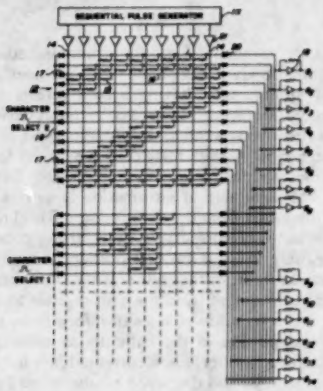
CIRCUIT ARRANGEMENT FOR AN ELECTRIC DISCHARGE TUBE

Arthur Tisso Starr, 39 Northumberland Road, New Barnet, Hertfordshire, England

Original application May 6, 1965, Ser. No. 453,757, now Patent No. 3,503,063, dated Mar. 24, 1970. Divided and this application Nov. 20, 1969, Ser. No. 878,493

Int. Cl. G06f 3/14

U.S. Cl. 340—324 A **4 Claims**



For an electric discharge tube which forms character symbols on the fluorescent material on the face thereof, a circuit arrangement for selectively energizing electrodes within said tube. Said circuit arrangement has interconnections to said tube for determining the formation of said character symbols. According to one aspect of the present invention there is provided a circuit arrangement for modulating the pattern of voltages appearing on a set of electrodes in said electric discharge tube at predetermined intervals of time, comprising selection means for selecting a predetermined pattern corresponding to a symbol representing data, timing means for governing the timing of said predetermined intervals of time, and circuit means each having a set of interconnections determining said pattern.

3,641,558

MULTIPLEXED VIDEO GENERATION

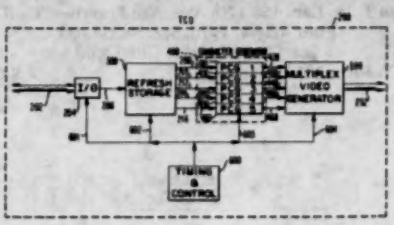
William C. Cook, Rockville, and Walter J. Hogan, Silver Spring, both of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1969, Ser. No. 878,711

Int. Cl. G06f 3/14

U.S. Cl. 340—324 A **5 Claims**

The number of sequential line buffers in a digital TV system including a symbol generator which consists of a group of segment generators is reduced by connecting in series a group of sequential line buffers. Each sequential line buffer is a shift register which contains the number of character positions representing one horizontal row of characters. For a 10-line-high character with six lines of vertical spacing between rows of characters, five segment generators and five sequential line buffers are used to achieve maximum hardware efficiency.



3,641,559

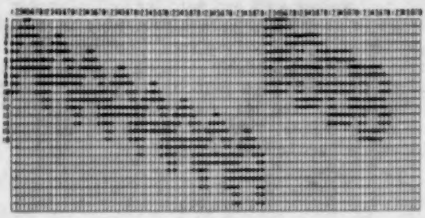
STAGGERED VIDEO-DIGITAL TV SYSTEM

Walter J. Hogan, Silver Spring, and Ancile E. Malden, Potomac, both of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1969, Ser. No. 878,712

Int. Cl. G06f 3/14

U.S. Cl. 340—324 A **3 Claims**



A display system including a symbol generator which consists of a group of segment generators. Each segment generator generates a portion of the symbol to be displayed in time sequence so that the segment generator which generates the first portion of the symbol would be free to generate first portion of a following symbol or the first portion of a symbol on an other display device while the other segment generators are generating the remainder of the first symbol. The outputs from this group of segment generators are transmitted through a group of multiplex gates which assemble the symbol segments into video data signals for a group of display devices. The transmission of the information signals to the segment generators is staggered so that during a specified period of time mutually exclusive symbol segments are presented on different displays. Since the staggering of the display presentation would result in the rows of symbols being displaced vertically on the different display devices, the vertical synchronization signals are also staggered to allow the vertical positioning of rows of symbols on all displays to be the same.

3,641,560

HIGH-SPEED ILLUMINATION APPARATUS

Joseph M. Klockenbrink, Riverside, Conn., assignor to Path Computer Equipment Inc., Stamford, Conn.

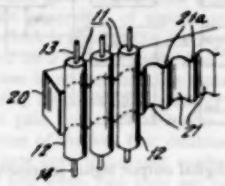
Filed Feb. 24, 1969, Ser. No. 801,635

Int. Cl. G08b 5/36

U.S. Cl. 340—343 **6 Claims**

A high-speed illumination apparatus advantageous for use in non-impact printers and character display devices. Rows

of openings are provided on a rotatable drum, with the openings in each row forming a specific character or symbol such that the character or symbol of each row differs from the character or symbol of every other row. A large number



of characters are provided in each row. In some applications, greater than 100 characters or symbols are provided per row. A line of characters to be either printed or displayed are examined for the purpose of illuminating lamps at positions in each row of the rotating drum which are present in the line of characters to be either printed or displayed. A single row of lamps is provided in a lamp assembly which is mounted in a stationary fashion within the drum. Those specified character positions of a particular row which are to be illuminated are enabled by energizing the cathode and anode electrodes of the selected lamps. A single trigger pulse is applied for igniting the lamps through a common conductive bar which has the dual function of operating as the trigger electrode and as reflector means for all of the lamps to concentrate illumination toward those selected characters formed within the row to be illuminated.

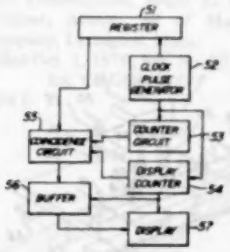
The illumination may be converted into a character display through the use of a long-persistence, luminescent panel or, alternatively, may be printed through the use of either a paper having a light-sensitive coating or may be printed upon plain paper through the use of a transfer drum which transfers the image formed by a sensitized coating upon the transfer drum which is then transferred and imprinted upon the plain paper.

3,641,561

DISPLAY SYSTEM FOR USE IN DESK TOP COMPUTERS

Kinichiro Osugi, Yokohama-shi; Yoshiaki Suzuki, Tokyo; Tokio Mori, and Toshiharu Inamoto, both of Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 11, 1969, Ser. No. 798,407
Claims priority, application Japan, Feb. 28, 1968, 43/13228
Int. Cl. G06f *7/02*
U.S. Cl. 340—324 R **4 Claims**



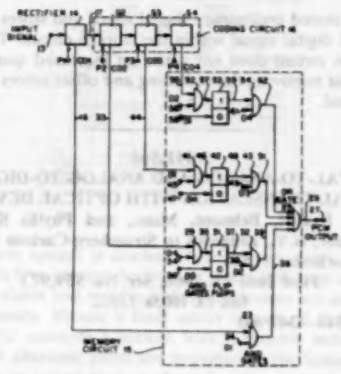
A display system for use in a serial-type desk top computer having a recirculating shift register and a plurality of cold-cathode gas readout tubes adapted to indicate information stored in the register sequentially. The system includes in combination a clock pulse generator operating the register, incremental and decremental counters connected to receive the output of the pulse generator, a coincidence circuit receiving the outputs of the register and both counters at its input side and providing a signal to light a corresponding one of the tubes so that the information may be displayed on the tubes from the most significant character to the least significant character successively for a display period of time sufficiently long to be visually recognized for each character being displayed thereon.

3,641,562

METHOD OF TIMING A SEQUENTIAL APPROXIMATION ENCODER

Toshio Kobayashi, Yokohama, and Yukihiko Mineshima, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 9, 1970, Ser. No. 9,497
Claims priority, application Japan, Feb. 14, 1969, 44/10898
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD **1 Claim**



A method of coding in a plurality of unit coding circuit stages connected in cascade and of the same number as the coded bits comprises the steps of applying input signals to a first unit coding circuit stage, rectifying the input signals in the first stage, discriminating the polarity of the input signals in the first stage, successively applying the absolute value output signals of the first stage to the following stages for coding the absolute value signals, and converting the coded pulses of the following stages into series-coded pulses by discriminating the polarity of the input signals in the first stage in the coding period for the absolute value signals in the following stages.

3,641,563

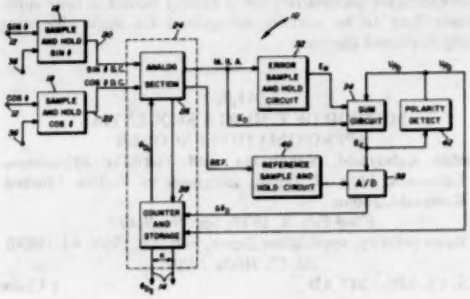
CORRECTION CIRCUIT FOR CONVERTERS

Glenn F. Cushman, Burlington; Brijeshwari Prasad, Methuen, and Robert W. Wisleder, Wilmington, all of Mass., assignors to Litton Systems, Inc., Burlington, Mass.

Filed Feb. 25, 1970, Ser. No. 14,025
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD **11 Claims**

An error correction circuit for an analog-to-digital converter is shown wherein and analog-to-digital converter includes a counter-and-storage circuit that stores an analog input signal in the form of a preliminary digital signal. An error sample-and-hold circuit receives an error signal, including switching and offset errors, generated by the analog-to-digital converter and stores that signal while the switching and offset errors are removed therefrom. The resulting signal

is then applied to a second analog-to-digital converter where it is converted to a digital error signal which is applied to the counter circuit. The counter removes the digital error signal



from the stored preliminary digital signal and stores the final corrected digital signal within the storage circuit. This error correction circuit does not cause an increased quantization error while removing the switching and offset errors from the input signal.

3,641,564

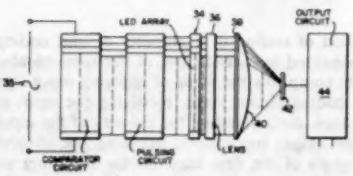
DIGITAL-TO-ANALOG AND ANALOG-TO-DIGITAL SIGNAL TRANSLATION WITH OPTICAL DEVICES

Matthew Fassett, Belmont, Mass., and Phyllis S. Unger, Rochester, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed June 23, 1966, Ser. No. 559,973

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 AD **4 Claims**



A signal-translating apparatus is disclosed wherein an electrical signal can be transformed between analog form and digital form by use of electrically energizable radiation sources which are selectively energized to produce a radiation signal in one form and electrical and optical means are used to modify this radiation signal into an electrical signal of a different form.

3,641,565

DIGITAL RESOLVER

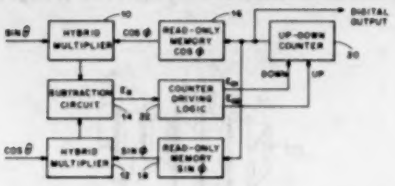
Richard J. Ivers, Arlington, and William H. McDonough, Acton, both of Mass., assignors to Dynamics Research Corporation, Wilmington, Mass.

Filed Sept. 2, 1969, Ser. No. 854,658

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 SY **6 Claims**

A digital system for providing precise high-resolution angular data directly from analog input signals. Quadrature-phased input signals are processed to provide an error signal which is employed to control a digital feedback loop operative to generate a digital output signal representative of input angular data.



3,641,566

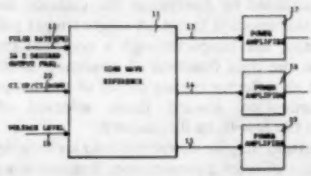
FREQUENCY POLYPHASE POWER SUPPLY

Charles E. Konrad, and Burnette P. Chausse, both of Roanoke, Va., assignors to General Electric Company

Filed Sept. 29, 1969, Ser. No. 861,840

Int. Cl. H03b *19/00*; **H03r** *13/02*

U.S. Cl. 340—347 DA **7 Claims**



An apparatus for providing a polyphase alternating current including a pulse generator and a digital counter for converting the pulses into a predetermined number of distinct consecutive signals which are cyclically applied to a decoding circuit for each phase, each having one output line per signal. A digital to analog converter connected to each decoding circuit designates a voltage level to each consecutive signal which is proportional to the sine of the phase angle during which the signal occurs.

3,641,567

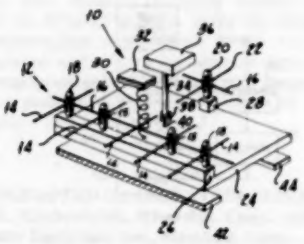
NONCONTACTING KEYBOARD AND INTERLOCKNG SYSTEM

Ivan O. Fieldgate, Halesite, N.Y., assignor to Potter Instrument Company, Inc., Plainview, N.Y.

Filed Mar. 9, 1970, Ser. No. 17,771

Int. Cl. G08c *1/00*

U.S. Cl. 340—365 **1 Claim**



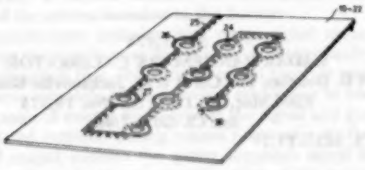
A noncontacting keyboard encoder having an interlocking system for preventing erroneous readouts in response to a

concomitant actuation of a plurality of keys in which there is provided for each character to be encoded a key-operated floating plate which is eccentrically biased to a position at which respective saturating magnets carried thereby are positioned adjacent a column of locations at which saturable cores are selectively arranged in a coded pattern and adjacent a saturable gate core spaced from the column normally to inhibit generation of signals on respective output lines each of which is common to corresponding positions of all columns and on a readout gating line common to all gate cores in response to an interrogating signal on an interrogating line threading all cores. Actuation of a key first enables the associated gate core and then the associated column cores and release of the key first disables the column cores and then the gate core to prevent readout until one key is fully actuated and when two keys are concomitantly actuated.

3,641,568
KEYBOARD FOR CALCULATING MACHINES, TELEPRINTERS, TERMINALS AND THE LIKE

Riccardo Brescia, Ivrea, and Lucio Montanari, Cascinette d'Ivrea, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Turin, Italy

Filed Aug. 31, 1970, Ser. No. 68,392
Claims priority, application Italy, Sept. 1, 1969, 53173 A/69
Int. Cl. G08c *9/04*
U.S. Cl. 340—365 **12 Claims**

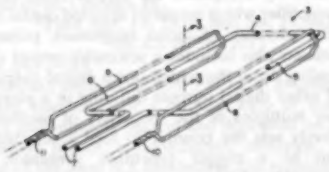


In a keyboard for calculating machines and the like having a magnetic circuit and means for generating a magnetic flux therein, a means operated by depressing the keys for causing a variation in the magnetic flux and detecting that variation including a ferromagnetic plate having a plurality of openings through which ferromagnetic elements can be caused to move by the action of the keys, and a plurality of detecting windings disposed about the openings in accordance with a predetermined digital code whereby an electromotive force is generated at the ends of the detecting winds when a ferromagnetic element moves through an opening in the ferromagnetic plate.

3,641,569
HIGHWAY VEHICLE SENSOR SYSTEM

David Bushnell, Framingham; Roger L. Fuller, Stow, and Joseph J. Oliver, Allston, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 1, 1970, Ser. No. 77,155
Int. Cl. G08g *1/015*
U.S. Cl. 340—38 L **10 Claims**

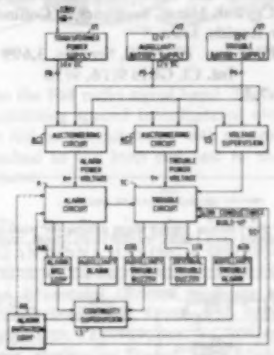


A highway vehicle sensor, consisting of a main loop energized with low radiofrequency energy and having side legs spaced apart a predetermined distance, is buried in the surface of a highway. Around each side leg is a probe loop in which a signal is generated by the presence of a vehicle over the probe loop. The two output signals from the two probe loops are processed to determine vehicle presence, direction of travel, speed and length and headway between vehicles on the highway.

3,641,570
ALARM SYSTEM

Francis T. Thompson, 3482 Treeline Drive, Murrysville, Pa.

Filed Apr. 2, 1969, Ser. No. 812,621
Int. Cl. G08b *17/06, 19/00, 29/00*
U.S. Cl. 340—409 **10 Claims**

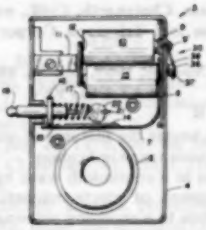


An alarm system is disclosed wherein an alarm initiation loop, including sensing devices, an alarm bell loop and other auxiliary alarm and trouble indicating devices are supervised for continuity. Should a fault occur in one of these loops, such as for example a broken wire, a trouble indication is given and alternate paths are provided in the initiation and bell loops to insure that an alarm is given in case an alarm condition, such as a fire, should occur. A trouble indication is also given if the main power source should fail or if any auxiliary power sources utilized should fail or drop below safe limits. Also a trouble indication is given if a spurious conductive path should gradually build up in the alarm initiation load due to moisture for example.

3,641,571
COMBINATION BURGLAR AND FIRE ALARM

Irwin I. Kitman, 5840 Beacon St., Pittsburgh, Pa.

Filed Sept. 15, 1969, Ser. No. 857,793
Int. Cl. G08b *19/00*
U.S. Cl. 340—420 **4 Claims**



A burglar alarm which may be mounted on the inside of a door, having a switch that is actuated upon opening of the

door to sound an alarm. A lock may be operated from the outside or inside by a key to prevent operation of the alarm when opening the door.

The alarm, with modifications, may be operated in several ways, such as by a placement on the floor and opening of the door; by triggering as the result of opening a window blind when the alarm is mounted below the window; and by mounting on the inside of a door so as to be operated by opening thereof.

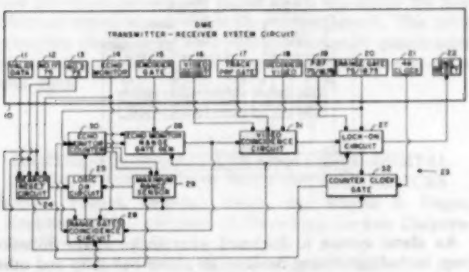
A fire alarm may be combined therewith so as to be operated by melting of a fusible element.

3,641,572

DIGITAL ECHO PROTECTION CIRCUIT FOR DME AND TACAN

Michael W. Lundgreen, Cedar Rapids, Iowa, and Rolin H. Denniston, Crystal, Minn., assignors to Collins Radio Company, Cedar Rapids, Iowa

Filed Jan. 19, 1970, Ser. No. 3,699
Int. Cl. G01s *9/16, 9/56*
U.S. Cl. 343—7.3 **10 Claims**



A false distance indication sensing and correction circuit for aircraft radio distance measuring systems, such as DME, that searches from zero miles out to the DME range gate or 100 miles whichever is shorter. When the echo monitor range gate is coincident with a decoded video pulse, it looks again at the same range two more times and then continues on outbound if decoded video pulses do not reappear in the echo monitor range gate with the repeated looks. If the decoded video is a valid synchronous range reply pulse, the echo monitor range gate stays at that range and after 0.2 second, when the DME is in the 75 Hz. PRF (Pulse Repetition Frequency) mode, or 0.8 second, when the DME is in the 18.75 Hz. PRF mode of operation, the DME is trigger reset to search thereby initiating another search cycle.

3,641,573

PSEUDONOISE RADAR SYSTEM

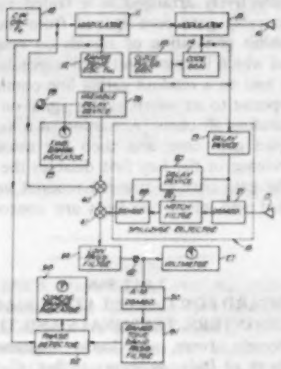
Damian F. Albanese, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,057
Int. Cl. G01s *9/04*
U.S. Cl. 343—12 R **8 Claims**

A radar system having the features of spillover discrimination and unambiguous range indication.

Spillover occurs in a continuous wave radar, for example, in direct transmission of electromagnetic energy from a transmitting antenna to a receiving antenna. It is desirable to suppress this energy in the receiver so that the target echo will come in clear. The invention provides this suppression by using a low-pass filter having a cutoff frequency less than f_w, where f_w is the word rate in a pseudonoise radar system.

In the case of ambiguous range, the carrier is modulated with a pilot tone or range tone. If the range tone wavelength is at least twice as long as the maximum range desired, the



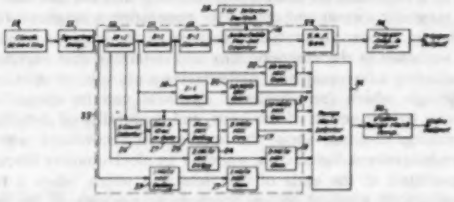
received range tone may be filtered out and used with a phase detector to produce an unambiguous range indication.

3,641,574

RADAR RANGEMARK CALIBRATOR

Robert D. Douglas, 298 Coral Way, Jacksonville Beach, Fla.

Filed Mar. 16, 1970, Ser. No. 19,975
Int. Cl. G01s *7/40*
U.S. Cl. 343—17.7 **10 Claims**



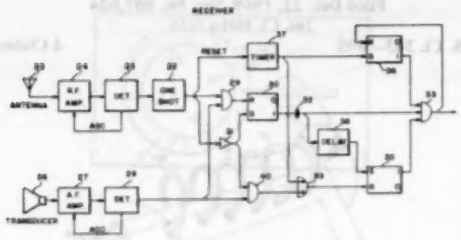
A calibrator for a radar system calibrated in standard distance units including an oscillator producing analog signals having a frequency of oscillation of a whole digit ratio to a predetermined number of whole standard distance units, a squaring amplifier converting the analog signals to digital signals, and digital logic means for scaling down the digital signals into a plurality of digital outputs differing in a plurality of whole number multiples of the frequency of oscillation. A switch selectively completes the circuit from the logic means to an amplifier which amplifies selected digital outputs to provide the plurality of video rangemark pulses. The digital logic means also includes a selectable preset counter for further scaling down the scaled down digital outputs into a plurality of other digital outputs differing in a plurality of whole number multiples of the frequency of oscillation. A switch selectively sets the counter to feed a selected other digital output to a trigger repetition generator which generates a plurality of trigger repetition pulses for feeding into an amplifier. Delay means are also incorporated in the digital logic means for selectively delaying some of the digital outputs.

3,641,575

REMOTE CONTROL APPARATUS

John H. Auer, Jr., Fairport, and Jerry P. Huffman, Rochester, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Mar. 12, 1970, Ser. No. 18,980
Int. Cl. H03k 5/20
U.S. Cl. 343—225 12 Claims



There has been provided remote control apparatus for generating signals over a communications means which selectively controls the actuation of apparatus at remotely located devices from a control location in accordance with the distance of the control location to the devices.

The improvement includes dual range signal means for transmitting the signals over two ranges of energy having different propagation time characteristics and receiver means at each of these remotely located devices responsive to each associated range of energy for receiving the signal and generating associated outputs. Gating means responsive to the first associated output initiates the gating sequence signal having a duration relative to the propagation time of the second associated output. Output control means responsive to the gating sequence signal and the second associated output activates the apparatus when the second associated signal occurs within the duration of the gating sequence signal.

There has also been included a timing means coupled to the communication means at the remote location responsive to the control signals for generating a second gating signal of predetermined duration longer than the first gating signal for each control pulse. A counter responsive to the first gating means generates an output signal after a predetermined number of registered first gating signals, the output signal for activating the apparatus at the remotely located devices. Reset means responds to the control signals, the first gating means and the timing means for cancelling the counts stored in the counter when a control signal occurs during the first gate interval and without said second gate interval thereby only control signals of a selected range of frequency are capable of driving the counter to predetermined counts for generating the output signal.

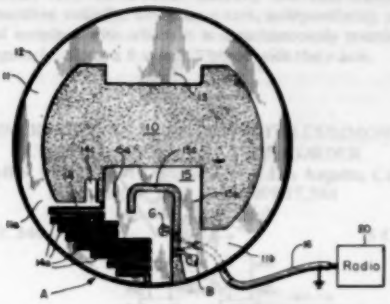
3,641,576

PRINTED CIRCUIT INDUCTIVE LOOP ANTENNA

Walter Farbanish, Park Ridge, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 13, 1970, Ser. No. 27,562
Int. Cl. H01q 11/12
U.S. Cl. 343—743 5 Claims

A relatively high-impedance FM radio antenna is provided consisting essentially of a circular loop of conductive foil having a discontinuity therein and deposited on one side of a substantially planar, nonconductive substrate. Attached to one end of the loop is a conductive foil impedance element, such as an inductor, for providing impedance matching in order to efficiently transfer the received electrical signals from the high-impedance antenna to a relatively low-impedance radio input circuit. A conductive foil capacitance element is connected between the impedance-matching element and the other end of the loop in order to parallel tune



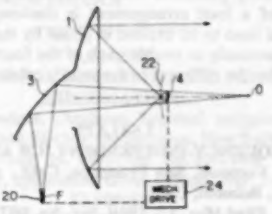
the antenna to the FM radio signal band. The capacitance is formed by depositing spaced interdigitated elongated strips of conductive foil on the substrate, with successive strips alternately attached to the loop end and to the impedance-matching element.

3,641,577

SCANNING ANTENNA HAVING A SPHERICAL MAIN REFLECTOR WITH MOVEABLE SUBREFLECTOR

Yves Tocquec, Marcoussi, France, assignor to Compagnie Generale d'Electricite, Paris, France

Filed Mar. 12, 1969, Ser. No. 806,458
Claims priority, application France, Mar. 12, 1968, 143418
Int. Cl. H01q 19/14
U.S. Cl. 343—754 12 Claims



An antenna having a large spherical reflector and a small reflector, wherein the main lobe may be oriented with respect to the large spherical reflector by virtue of the displacement of the small reflector, these displacements being rotations around the center of curvature of the large reflector, and the waves irradiating the small reflector being spherical around the same center, the beam formed by these waves shifting with the displacement of the small reflector.

3,641,578

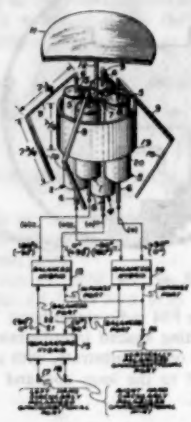
DISCONE ANTENNA

William M. Spanos, Wayne, and Michael S. Polgar, Ocean Port, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed July 21, 1970, Ser. No. 56,830
Int. Cl. H01q 1/48, 13/00, 21/00
U.S. Cl. 343—773 8 Claims

A multimode discone antenna providing simultaneously, without interference, right- and left-hand circularly polarized omnidirectional patterns and a vertically polarized omnidirectional pattern. Four coaxial cables are disposed parallel to each other with the outer conductors electrically coupled together. An extension of the central conductor of each

coaxial line is extended downward from the upper end of and at a given angle less than 90° to the associated one of the coaxial lines. This arrangement, when the two pairs of diagonally disposed coaxial lines are excited in a balanced



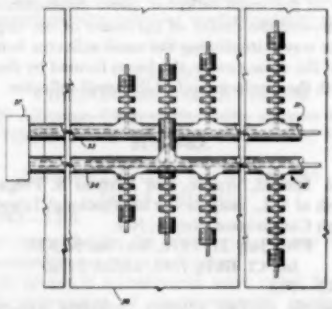
relationship and the pairs are excited orthogonally by first energy, provides simultaneously both right- and left-hand circularly polarized omnidirectional patterns. When a disc is electrically connected to the outer conductors of the four coaxial lines and is physically supported in spaced and orthogonal relation to the upper end of the four coaxial lines, the antenna, in addition, simultaneously provides, when each of the four coaxial lines are excited in phase by second energy, a vertically polarized omnidirectional pattern. An embodiment of a feed arrangement is disclosed enabling the four coaxial lines to be excited in phase by the second energy and simultaneously to enable each of the four coaxial lines to be excited by the different orthogonally related first energy.

3,641,579

FREQUENCY-INDEPENDENT ICR ANTENNA

George N. Voronoff, San Francisco, Calif., assignor to Textron Inc., Belmont, Calif.

Filed Mar. 17, 1969, Ser. No. 807,603
Int. Cl. H01q *11/10, 1/36*
U.S. Cl. 343—792.5 7 Claims



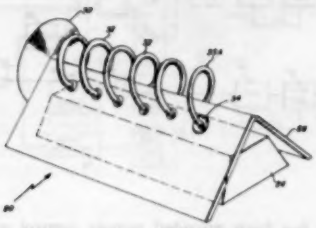
The invention provides interrupted coaxial-line radiators upon a ground plane and arranged in a frequency-independent manner for broadband radiation from a flush-mounted structure. The radiators may be arranged in a log-periodic array or in a spiral array for frequency-independent operation.

3,641,580

FRACTIONAL TURN HELICAL ANTENNA

George J. Monser, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 22, 1969, Ser. No. 887,024
Int. Cl. H01q *1/36*
U.S. Cl. 343—895 4 Claims



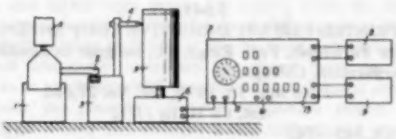
A modified helical antenna comprising an array of uniformly spaced fractional turns of a helix mounted on a ground plane bent in the form of a gable such that the fractional turns are positioned outside the ridge of the gable about a common axis parallel to the ridge. The ends of the fractional turns are in electrical contact with the ground plane except for one end of the first fractional turn which passes through the ground plane into a connector. A reflecting plate is positioned perpendicularly to the axis at the end of the antenna opposite the connector to provide a backwardly directed wave which enhances the directivity pattern.

3,641,581

METHOD AND ARRANGEMENT FOR REGISTERING AND RECORDING OF DEFORMATIONS OF MATERIALS

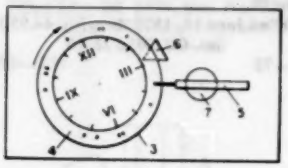
Milan Holecek, Prague, Czechoslovakia, assignor to Projektovy ustav dopravnich a inzenyrskych staveb, Prague, Czechoslovakia

Filed June 17, 1969, Ser. No. 834,116
Claims priority, application Czechoslovakia, June 18, 1968, PV 4459/68
Int. Cl. G01d *9/10*; G01n *3/08*
U.S. Cl. 346—1 6 Claims



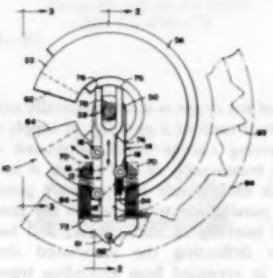
Deformations of material such as soil and rock due to prolonged application of pressure are automatically registered and recorded on record carriers moved through an equal step at given time interval which time intervals are increased automatically in the course of application of pressure.

3,641,582
RING MONITOR
George Constantin Theodoridis, 17 Colonnade Club, University of Va., Charlottesville, Va.
Filed July 15, 1970, Ser. No. 55,189
Int. Cl. G01d 9/10
U.S. Cl. 346—21 1 Claim



An electronically amplified acoustic signal is used to activate a marker and record the time of occurrence of the signal on a rotating disc.

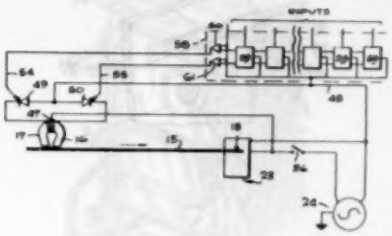
3,641,583
ELECTRODYNAMIC TRANSDUCER
Gerhard Cless, Skokie, and Jerome L. De Boo, Barrington, both of Ill., assignors to Teletype Corporation, Skokie, Ill.
Filed May 28, 1970, Ser. No. 41,486
Int. Cl. G01d 5/20
U.S. Cl. 346—29 10 Claims



An input/output assembly comprises a pair of members coupled such that a first thereof carrying an input/output element is reciprocative relative the second at each position of the second; and both members are translocatable simultaneously in a path extending transversely of the direction of reciprocation. First and second electrical induction coils, having portions which are coupled in the magnetic flux field of a permanent magnet structure, are secured to the first and second members, respectively, with the coupled portions disposed in planes having orthogonal aspects, each to the other. The second coil is circumposed about a rail which is included in the magnetic structure and is movable longitudinally thereof in response to magnetmotive forces when the transducer is adapted as a motor and in response to mechanical forces applied to the element when the transducer is adapted as a generator for generating an electrical effect therein. The displacement of the second coil results in simultaneous movement of the first coil longitudinally of said rail. The first coil is arranged in said flux field for movement transversely of said rail independently from the second coil such that the element is reciprocated when the transducer operates as a motor and an electrical effect is generated therein upon movement of the element along a vector having a velocity coordinate corresponding to the first coil when the transducer operates as a generator.

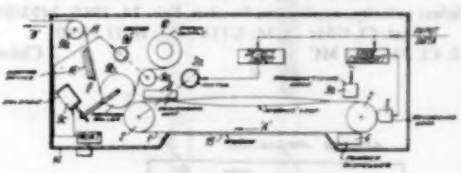
The rail may be arcuate whereby the first member is reciprocative radially, along an *r* axis, independently of said second member with which it is simultaneously translocatable angularly, along a θ axis in a plane with the *r* axis.

3,641,584
INCREMENTAL RECORDER WITH COMMON CONTROL OF DRIVE AND RECORDER
Wendell S. Miller, 1341 Comstock Ave., Los Angeles, Calif.
Filed Aug. 4, 1969, Ser. No. 847,354
Int. Cl. G11b 15/20
U.S. Cl. 346—74 M 5 Claims



Apparatus for recording a series of data bits on a record track, and including a motor preferably operable by alternating current to advance the record track one step for each half cycle of the alternating current in either direction, and a recording head structure for recording data bits on the track during one of the half cycles of the alternating current but not during the reverse half cycle.

3,641,585
APPARATUS FOR DISPLAYING AND PRINTING INFORMATION
Robert James Hodges, Cheshunt, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Aug. 26, 1969, Ser. No. 853,182
Claims priority, application Great Britain, Nov. 14, 1968, 53,999/68
Int. Cl. G03g 15/16, 15/22, 19/00
U.S. Cl. 346—74 MP 6 Claims



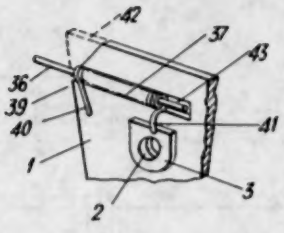
Apparatus for display and printing of received information by means of a continuous recording band of stainless steel of the type which when selectively magnetized forms the resulting information pattern throughout the thickness of the band. The band is powder treated on the one side for viewing the true image pattern therein and is powder treated on the other side as well for transferring the inverse image pattern therein to a permanent recording medium, thereby converting both sides to visible and true images. An alternative embodiment provides for a single twist in the band whereby it is first treated for viewing and then in accordance with the twist is recycled for purposes of generating permanent copy.

3,641,586

MAGNETIC RECORDING HEAD OF MULTIPLE CORE PRINTED CIRCUIT CONSTRUCTION

Jack Thomas Armon Woodward, and Edward Graham Jordan, both of Harlow, England, assignors to Standard Telephones and Cables Limited, London, England

Filed Nov. 5, 1969, Ser. No. 874,180
Claims priority, application Great Britain, Jan. 8, 1969, 1,233/69
Int. Cl. G11b 5/20, 5/28, 5/42
U.S. Cl. 346—74 MC 16 Claims



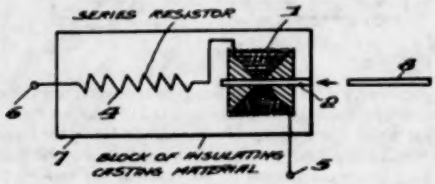
A magnetic recording device comprising a row of closely spaced core members each having a separate energization winding wherein each core winding combination is in fixed relationship with a corresponding single-sided printed circuit board, with an end turn and the associated core end thereof being flush with that printed circuit board edge perpendicular thereto which forms part of the device's recording surface. The terminations on the respective printed circuits of each winding and its corresponding input leads are cyclically staggered from board to board to allow the boards to be stacked together without increasing the overall length of the stack, thus permitting the cores to be separated by substantially the thickness of the windings only. Means are included for aligning each board with respect to the others and for aligning the device with the recording medium.

3,641,587

MEANS FOR RECORDING TRANSIENT VOLTAGES

Lars-Goran Virsberg, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Dec. 22, 1969, Ser. No. 887,047
Claims priority, application Sweden, Feb. 24, 1969, 2492/69
Int. Cl. G01r 19/16; G11b 5/12; H01f 27/40
U.S. Cl. 346—74 MC 2 Claims



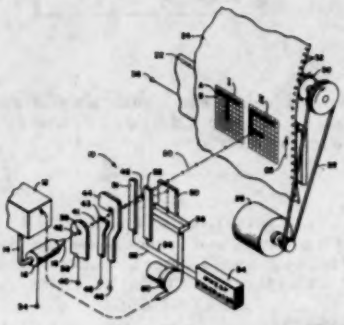
For recording overvoltages in a high-voltage network a coil is used wound on a nonmagnetic, insulating frame providing with a double conical space for the winding. The coil is provided with an axial hole through which a magnetic tape is drawn. The coil is connected to the network over a voltage divider and the coil, together with a series resistor, is cast into a block to form a compact unit.

3,641,588

ELECTROSTATIC PRINTER

Jack L. Metz, Des Plaines, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed June 10, 1970, Ser. No. 44,953
Int. Cl. G01d 15/18
U.S. Cl. 346—75 3 Claims



A stream of ink drops is electrostatically moved in a printing course from each of a plurality of supply nozzles toward an ink receiving carrier which is moved vertically in a straight path transversely of said course. A sweep voltage associated with each nozzle is repeatedly generated across a first pair of parallel electrodes which are generally horizontally spaced laterally of said course, and has a magnitude adapted for deflecting the associated stream generally horizontally in repeated lines extending transversely of the path of carrier travel and the course between the nozzle and the carrier. The movement of the carrier is adapted to generate one dimension of a two dimensional character from each stream, the sweep of the trace made by the associated "horizontally"deflected ink stream generating the other dimension.

A print or nonprint mode is produced by selected of a pair of voltages applied across a second pair of parallel electrodes which are disposed about the course of each stream and generally vertically spaced. In the print mode, each stream remains in its printing course by clearing the edge of a mask. In the nonprint mode, each stream is deflected generally vertically from its course onto the mask and prevents printing. Accordingly, character definition is obtained. The edge of the mask is a sawtooth configuration having sloping segments, each of which is associated with one stream.

To produce characters which are "squared" to the carrier, the electrodes of each first pair are nonparallel to the direction of the path of carrier movement. Their angle of tilt from a parallel condition is a function of the speed of the carrier such that a line trace resulting from a single sweep of an associated stream of ink drops will mark the carrier normal to the path of carrier movement; and the edge of the mask is parallel to the line along which each ink stream is "horizontally" deflected when printing.

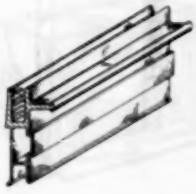
DESIGNS

FEBRUARY 8, 1972

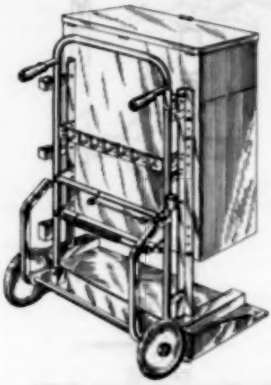
222,930
HAT
Barbara L. Goldfarb, 30165 Stellamar Drive, Birmingham, Mich. 48010
Filed May 25, 1970, Ser. No. 23,120
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—239

222,931
DISPENSING CONTAINER FOR LIQUIDS OR THE LIKE
Louis V. Nigro, Saugus, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Oct. 26, 1970, Ser. No. 25,634
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—83

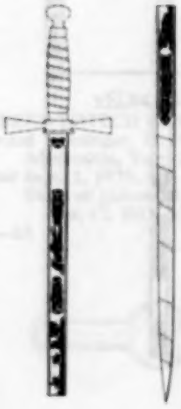
222,932
EXTRUDED PLASTIC MEETING RAIL FOR WINDOW UNIT
Raymond M. Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed May 14, 1970, Ser. No. 22,973
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6



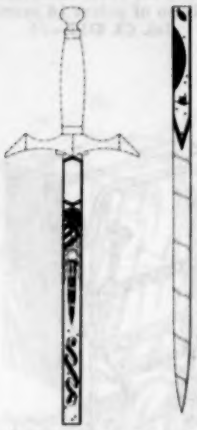
222,933
MOBILE STORAGE CABINET
Hesper P. Brown, 1314 Portland Ave., Walla Walla, Wash. 99362
Filed June 26, 1970, Ser. No. 23,679
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—3



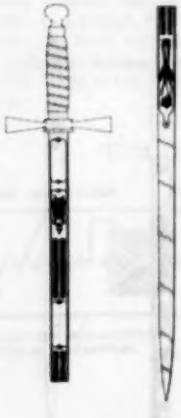
222,934
SWORD BLADE
Eric L. Cole, London, England, assignor to Wilkinson Sword Limited, London, England
Filed June 16, 1970, Ser. No. 23,507
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—1



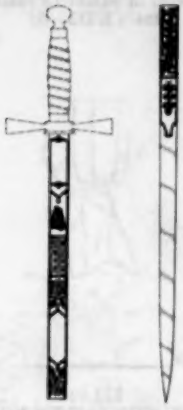
222,935
SWORD BLADE
Eric L. Cole, London, England, assignor to Wilkinson Sword Limited, London, England
Filed June 16, 1970, Ser. No. 23,508
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—1



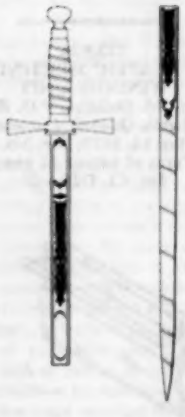
222,936
SWORD BLADE
Eric L. Cole, London, England, assignor to Wilkinson Sword Limited, London, England
Filed June 16, 1970, Ser. No. 23,510
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—1



222,937
SWORD BLADE
Eric L. Cole, London, England, assignor to Wilkinson Sword Limited, London, England
Filed June 16, 1970, Ser. No. 23,511
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—1



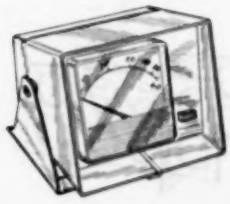
222,938
SWORD BLADE
Eric L. Cole, London, England, assignor to Wilkinson Sword Limited, London, England
Filed June 16, 1970, Ser. No. 23,512
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—1



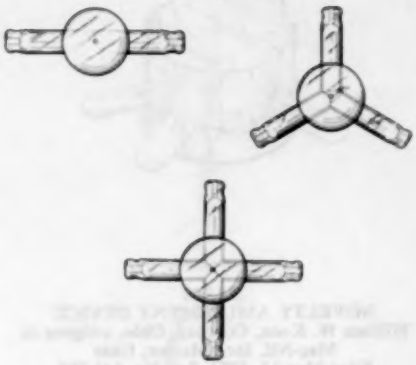
222,939
OIL CONTAINER
Robert V. Haas, Colonia, N.J., assignor to The Singer Company, New York, N.Y.
Filed Oct. 21, 1970, Ser. No. 25,584
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—5

222,940
FIREPLACE GRATE
Randall H. Eaves, Chattanooga, Tenn., assignor to Desoto, Inc., Des Plaines, Ill.
Filed Sept. 28, 1970, Ser. No. 25,242
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—98

222,941
DEPTH METER
Robert C. Knutson, Rosemount, Minn., assignor to Vexilar, Inc., Minneapolis, Minn.
Filed Sept. 11, 1970, Ser. No. 24,948
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D26—1



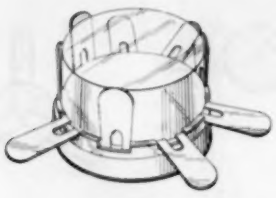
222,942
REED SWITCH ENVELOPE
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed Sept. 2, 1970, Ser. No. 24,806
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



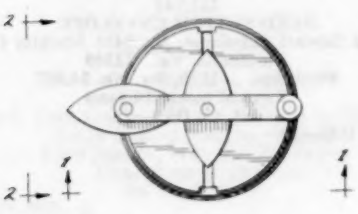
222,943
REED SWITCH ENVELOPE
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed Sept. 2, 1970, Ser. No. 24,807
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

222,944
REED SWITCH ENVELOPE
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed Sept. 2, 1970, Ser. No. 24,808
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

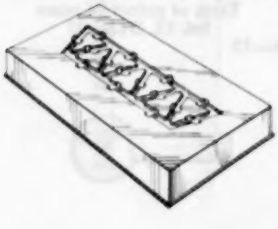
222,945
GAME PIECE BOX
William W. Knox, Concord, Ohio, assignor to Mag-Nif, Inc., Mentor, Ohio
Filed May 13, 1971, Ser. No. 143,295
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



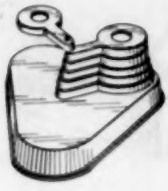
222,946
NOVELTY AMUSEMENT DEVICE
William W. Knox, Concord, Ohio, assignor to Mag-Nif, Inc., Mentor, Ohio
Filed May 13, 1971, Ser. No. 143,288
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



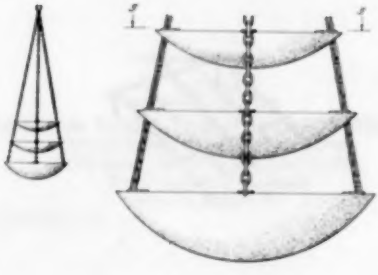
222,947
TRANSPOSITION PUZZLE
William W. Knox, Concord, Ohio, assignor to Mag-Nif, Inc., Mentor, Ohio
Filed May 13, 1971, Ser. No. 143,293
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



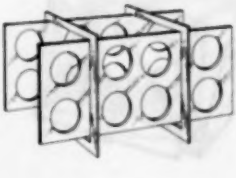
222,948
STACKING PUZZLE
William W. Knox, Concord, Ohio, assignor to Mag-Nif, Inc., Mentor, Ohio
Filed May 13, 1971, Ser. No. 143,294
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



222,949
HANGING PLANTER
Raymond Godfrey Souder, 808 NW. 1st Ave., Fort Lauderdale, Fla. 33311
Filed Oct. 23, 1970, Ser. No. 25,609
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3



222,950
STORAGE RACK FOR WINE BOTTLES OR THE LIKE
Eugene J. Majewski, 121 Elmore St., Park Ridge, Ill. 60068
Filed Sept. 2, 1970, Ser. No. 24,809
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—29

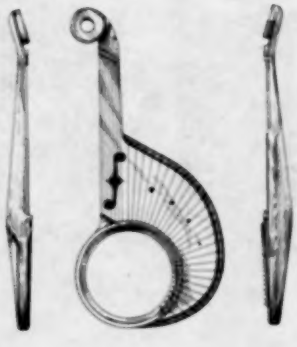


222,951
COMBINED LITTER AND ARTICLE STOWAGE BUCKET FOR AUTOMOBILES OR THE LIKE
Freeman Stringer, 209 W. 3rd St., Lee's Summit, Mo. 64063
Filed Sept. 24, 1970, Ser. No. 25,182
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D49—34

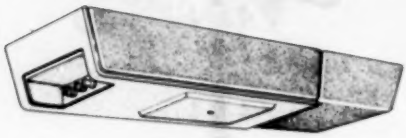
222,952
SPOON OR SIMILAR ARTICLE
Shiro Kaneko, 58 Ohaza Matsuoka-Shinden, Yoshida-cho, Nishi Kanbara-gun, Nugatan-ken, Yoshida, Japan
Filed Sept. 24, 1970, Ser. No. 25,579
Claims priority, application Japan Mar. 25, 1970
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

222,953
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Nov. 16, 1970, Ser. No. 26,025
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

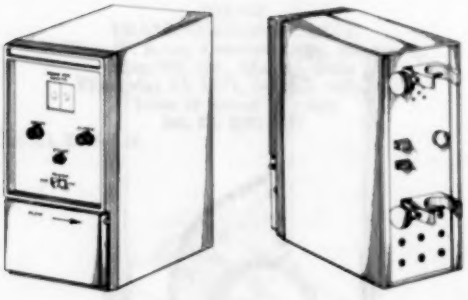
22,954
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manhein Gardens, Philadelphia, Pa. 19144
Filed Sept. 28, 1970, Ser. No. 25,211
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1



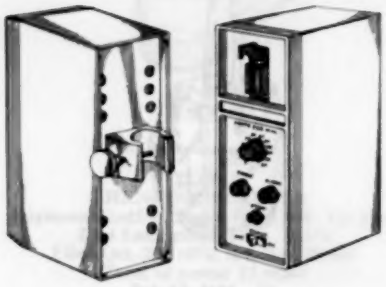
222,955
TELEVISION CAMERA OR SIMILAR ARTICLE
Donald K. Krumin, Fort Lauderdale, and Richard John Toth, Oakland Park, Fla., assignors to Motorola, Inc., Franklin Park, Ill.
Filed Oct. 29, 1970, Ser. No. 25,708
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D61—1



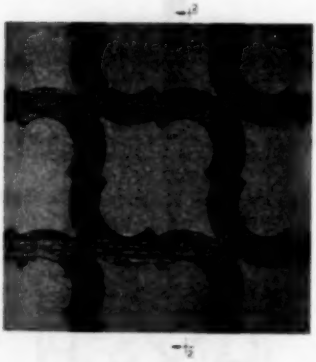
222,956
FLUID DELIVERY APPARATUS
Stephens N. Sato, San Diego, Calif., assignor to Ivac Corporation, San Diego, Calif.
Continuation-in-part of design application Ser. No. 20,773, Jan. 6, 1970. This application Sept. 16, 1970, Ser. No. 25,029
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



222,957
FLUID DELIVERY APPARATUS
Stephens N. Sato, San Diego, Calif., assignor to Ivac Corporation, San Diego, Calif.
Continuation-in-part of design application Ser. No. 20,774, Jan. 6, 1970. This application Sept. 16, 1970, Ser. No. 25,030
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



222,958
SOLID SURFACE FLOOR COVERING OR SIMILAR ARTICLE
Oscar G. Tejeda, Newark, and Harry A. Shortway, Glen Rock, N.J., assignors to Congoleum Industries, Inc., Kearney, N.J.
Filed Mar. 17, 1969, Ser. No. 16,258
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D92—4



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF FEBRUARY, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AB Akerlund & Rausing: *See*—
Dilot, Rolf Nagnus, 3,640,188.

Abe, Kozo: *See*—
Nakanishi, Michio; Kobayashi, Ryosuke; Abe, Kozo; and Mukai, Toshihiko, 3,641,060.

Abex Corporation: *See*—
Kohler, William H., 3,640,586.

Abramson, Aaron L. Time coded, coin control gate system. 3,641,314, Cl. 235-61.8

Abrasive Aids Pty. Limited: *See*—
Griffiths, Wilfred, 3,639,958.

Abrasive Development Limited: *See*—
Field, Anthony Gerard, 3,640,023.

Abriss, Murray S. Method for stabilizing latices. 3,640,935, Cl. 260-29.6

ACF Industries, Incorporated: *See*—
Nelson, Norman A., 3,640,299.

Acme-Hamilton Manufacturing Corporation: *See*—
Bauman, Joseph F.; Kurtz, Edward, Jr.; Cini, Adrian V.; and Antrobus, Robert E., 3,640,312.

Adaglio, Marie-Francoise. Warning device for cylinders for liquefied gas under pressure. 3,640,241, Cl. 116-109.

Adams, Gary A., to Kochring Company. Part removing mechanism for removing container parts and the like from nested stacks of parts. 3,640,408, Cl. 214-8.5

Adams, Robert B., to Moore Products Co. Flow meter. 3,640,133, Cl. 73-194.

Adams, Robert P., to Cenco Medical/Health Supply Corporation, mesne. Apparatus for tissue preparation. 3,639,999, Cl. 34-92.

Addressograph-Multigraph Corporation: *See*—
Raab, Lester R.; and Toby, Dennis E., 3,640,203.

Adelberg, Marvin. Medical liquid administration device. 3,640,277, Cl. 128-214.

Adolphi, Heinrich; Steimmig, Anna; and Spaenig, Hermann, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Imidazole synergist-enhanced phosphoric ester insecticide compositions and insect control therewith. 3,641,248, Cl. 424-212.

Advance Metal Products, Inc.: *See*—
Piccolo, Jerry, 3,640,294.

Advanced Terminals, Inc.: *See*—
Hutley, Ronald W. F., 3,640,521.

Aeroprojects Incorporated: *See*—
Maropis, Nicholas, 3,640,180.

Agfa-Gevaert Aktiengesellschaft: *See*—
Huber, Hans-Peter, 3,640,619.
Huckstadt, Harald; Saleck, Wilhelm; Randolph, August; Moll, Franz; and Ranz, Erwin, 3,640,715.
Von Konig, Anita; Moll, Farnz; Muller-Bardorff, Wolfgang; and Saleck, Wilhelm, 3,640,719.

Agolini, Franco, to Du Pont de Nemours, E. I., and Company. Polymeric phenone photosensitizers and blends thereof with other polymers. 3,641,217, Cl. 260-897.

Aho, Edwin, to Federal-Mogul Corporation. Bearing retainer construction. 3,640,594, Cl. 308-212.

Aichenegg, Paul C.: *See*—
Emerson, Carl D.; and Aichenegg, Paul C., 3,641,109.

Air Reduction Company, Incorporated: *See*—
Michals, Chester S.; and Motroni, Philip J., 3,640,166.

Aires, Ramon Hess: *See*—
Gamble, Edward Bernard; and Aires, Ramon Hess, 3,641,368.

Ajax Hardware Manufacturing Corporation: *See*—
Gewertz, Harry R.; and Read, George D., 3,640,558.

Ajinomoto Co., Inc.: *See*—
Ito, Tomiyasu,; Nagata, Koichiro; Ichikawa, Takehiko; and Kato, Tetsuya, 3,641,003.

Akatsu, Mitsuhiro: *See*—
Yamamoto, Hisao; Kitagawa, Sumio; Inaba, Shigeho; Sakai, Shigeru; Hirohashi, Toshiyuki; Maruyama, Isamu; Akatsu, Mitsuhiro; and Izumi, Takahiro, 3,641,002.

Akio, Huruya: *See*—
Ishiwata, Mamoru, and Akio, Huruya, 3,640,752.

Akita, Minoru: *See*—
Inamura, Seiichi; Kondo, Yusuke; Akita, Minoru; and Chikanari, Kenichi, 3,640,509.

Aktiebolaget Asea-Atom: *See*—
Stilling, Jens Ole, 3,640,117.

Aktiebolaget Electrolux: *See*—
Crener, Bengt Olof; Anderson, Erik Arne, and Ernolf, Stig Carl-Oskar, 3,639,939.

Aktiebolaget Kanthal: *See*—
Bizzarri, Venanzio, 3,640,907.

Aktienbolaget Bahco Ventilation: *See*—
Gustavsson, Karl-Axel Goran, 3,640,053.

Aktieselskabet Niro Atomizer: *See*—
Moller, Aage; and Straarup, Orla, 3,640,467.

Alarm Lock Company, Inc.: *See*—
Kossen, Dale J.; Foster, Richard W.; and Benson, Charles R., 3,641,396.

Alarmtronics Engineering, Inc.: *See*—
Reiss, Martin H.; and Cotter, William L., 3,641,547.

Albanese, Damian F., to International Telephone and Telegraph Corporation. Pseudonoise radar system. 3,641,573, Cl. 343-12.

Albers, Wouter; and Verberkt, Jacobus, to U.S. Philips Corporation. Semiconductor heterojunction device. 3,641,406, Cl. 317-237.

Albert, Joel M.: *See*—
Weiss, Shirley I., 3,640,027.

Albritton, George Washington, to Ashbrook Corporation. Aeration. 3,640,514, Cl. 261-91.

Alderson, William T.: *See*—
Hornschuch, Hanns; and Alderson, William T., 3,640,646.

Aleks, Vytant, to Brearley Company, The. Adjustable shelf and cabinet structure. 3,640,498, Cl. 248-230.

Alfa Romeo S.p.A.: *See*—
Garcea, Giampaolo, 3,640,259.

Alfa-Laval AB: *See*—
Thylefors, Henric Wilhelm, 3,640,452.

Alfelt, Lars-Goran: *See*—
Falk, Sven Uno; and Alfelt, Lars-Goran, 3,640,772.

All American Tool & Mfg. Co.: *See*—
Reibig, Eric A., 3,640,508.

Alleman, Raymond Arthur; and Henry, William Nelson. Apparatus for chemically etching surfaces. 3,640,792, Cl. 156-345.

Allen, C. Andrew, to Allen, S. A., Inc. Nipper apparatus for harvesting trees. 3,640,322, Cl. 144-34.

Allen, Clayton H.; and Heine, John C., to Bolt Beranek and Newman Inc. Linear phonograph record strip. 3,640,539, Cl. 274-42.

Allen, Joseph H.: *See*—
Hughes, Roland O.; and Allen, Joseph H., 3,641,323.

Allen, Robert J.; and Novack, Robert Lee, to Prototech Company, division of Bolt Beranek and Newman Inc. Method of operating fuel cell and preventing corrosion. 3,640,773, Cl. 136-86.

Allen, Robert J.: *See*—
Juda, Walter; Allen, Robert J., and Petrow, Henry G., 3,640,774.

Allen, S. A., Inc.: *See*—
Allen, C. Andrew, 3,640,322.

Allen, Terry S.; Lane, Lynn R.; and Swartz, Harold Lee, to Sperry Rand Corporation. Erection cutoff system for plural gyroscopes. 3,640,137, Cl. 74-5.34

Allied Chemical Corporation: *See*—
Anello, Louis G.; Boghosian, Edward Michael; Jones, Edward S.; Minhas, Pritam S.; Price, Alson K.; and Sweeney, Richard F., 3,641,083.
Lazarus, Stanley D., 3,641,111.
Miller, William A., 3,640,984.
Orfeo, Sabatino R.; and Murphy, Kevin P., 3,640,869.
Rast, Gustav E.; and Steiner, Russell I., 3,640,733.

Allied Thermal Corporation: *See*—
Drzala, Raymond J., 3,640,307.

Allis-Chalmers Manufacturing Company: *See*—
Armitage, Charles H.; Peek, Henry L.; and Pflanz, Herbert M., 3,641,293.
Armitage, Charles H.; Peek, Henry L.; and Pflanz, Herbert M., 3,641,294.
Dancy, Robert C., Jr., 3,640,276.
Nitz, Allen R., 3,641,300.
Ringland, William L.; and Kaeser, Ernst K., 3,641,467.

Allison, Jack B.: *See*—
Erhard, Albert E.; and Allison, Jack B., 3,640,679.

Allison, Thomas K. Seal assembly for sleeve type gravure rolls. 3,640,218, Cl. 101-375.

Allmanna Svenska Elektrisha Aktiebolaget: *See*—
Hellman, Erik, 3,640,116.

Allmanna Svenska Elektriska Aktiebolaget: *See*—
Ekstrom, Ake, 3,641,356.
Lundstrom, Hans, 3,640,111.
Lundstrom, Hans, 3,640,186.
Svedberg, Per, 3,641,404.
Virsberg, Lars-Goran, 3,641,587.

Alt, Bernhard: *See*—
Eimers, Erich; Deninger, Wolfgang; and Alt, Bernhard, 3,641,203.

Altherr, Russell G.; Shramovich, Paul F.; and Metzger, Nelson D., to Amsted Industries Incorporated. Internally reinforced shank for a railway coupler. 3,640,402, Cl. 213-62.

Althouse, Victor E., to Raychem Corporation. Heat recoverable article. 3,639,917, Cl. 2-270.

Altman, Murray; Craig, Mordecai R.; and Block, Irwin H., to Purdue Frederick Company, The. Display device. 3,640,010, Cl. 40-124.1

Aman, Horst: *See*—
Frind, Horst; Heid, Christian; and Aman, Horst,3,640,803.

American Chain & Cable Company, Inc.: *See*—
Klamp, Paul, 3,640,226.

American Cyanamid Company: *See*—
Callahan, Francis Marc, 3,640,991.
Gieseke, Elmer William; and Howald, Frank Peterson, 3,640,862.
Hermann, Divid Trimble; and Remley, Kenneth Herald, 3,640,924.
Holland, William Dean; Schmitt, Joseph Michael; and Griffith, Richard McDonald, 3,641,197.
Lewin, Benjamin Arthur; Sassiver, Martin Leon; and Shepherd, Robert Gordon, 3,641,015.
Rodgers, John Leo, 3,641,213.
Sheehan, Gerard Martin, 3,640,743.
Williams, Laurence Lyman, 3,640,936.
Wright, William Blythe, Jr.; and Brabander, Herbert Joseph, 3,641,029.

American Enka Corporation: *See*—
Fontijn, Wilhelmus J.; and van Drunen, Korstiaan J. M., 3,641,232.

American Express Investment Management Company: *See*—
Macovski, Albert, 3,641,264.

American Home Products Corporation: *See*—
Childress, Scott J.; and Szabo, J Lester, 3,641,114.
Freed, Meier E.; and Hertz, Elisabeth, 3,641,030.
Kim, Dong H.; and Santilli, Arthur A., 3,641,028.
Santilli, Arthur A.; and Kim, Dong H., 3,641,027.
Sellstedt, John H.; and Childress, Scott J., 3,641,000.

American Imagination Corporation: *See*—
Caillouet, James J., 3,640,453.

American Lava Corporation: *See*—
Lynch, James E., 3,641,401.

American Maize-Products Company: *See*—
Hullinger, Clifford H.; Cohen, Lawrence; and Yui, Nooyuki Henry, 3,640,842.

American Optical Corporation: *See*—
Van Ligten, Raoul F., 3,640,599.

American Standard Inc.: *See*—
Ares, Roland A., 3,640,090.
Brody, Herbert M., 3,640,086.
Griffin, James R.; and Forbes, Norman A., 3,639,920.
Liskowitz, John W., 3,640,626.

Amery, Geoffrey Wilfred: *See*—
Corbett, John Frank; and Amery, Geoffrey Wilfred,3,641,154.

A. M. Liaaen A/S: *See*—
Liaaen, Anders M., 3,640,644.

Ammerman, George Edward; and McFarlane, William, to Heatcraft, Inc. Open coil heating element assembly. 3,641,312, Cl. 219-532.

AMP Incorporated: *See*—
Demler, Henry William, Sr., 3,640,309.
Demler, Henry William, Sr.; and Weist, Edward Landis, 3,640,552.
Over, William Roderick, 3,639,977.
Plana, Roberto, 3,641,477.

Ampex Corporation: *See*—
Beck, Fred R.; Fanella, Robert J.; and Gioia, Norman F., 3,640,483.
Peratis, Michael P., 3,640,374.
Sidline, George B., 3,641,504.

Amsted Industries Incorporated: *See*—
Altherr, Russell G.; Shramovich, Paul F.; and Metzger, Nelson D., 3,640,402.

Anastasio, Frank J.; Brundage, Clinton F.; and Strakosch, Clarence P., to North American Rockwell Corporation, mesne. Apparatus for handling books. 3,640,407, Cl. 214-6.

Anderson, Daniel Gustav; Gladding, Edward Karcher; and Sullivan, Raymond, to Du Pont de Nemours, E. I., and Company. Cyano substituted perfluorovinyl ethers. 3,641,104, Cl. 260-465.6

Anderson, Edwin G. Telescopic cover assembly for open bed vehicles and latch assembly for use therewith. 3,640,565, Cl. 296-137.

Anderson, Erik Arne: *See*—
Crener, Bengt Olof; Anderson, Erik Arne; and Ernolf, Stig Carl-Oskar,3,639,939.

Anderson, Gordon C.; and Page, John D., to Maremont Corporation. Spindle assembly. 3,640,062, Cl. 57-88.

Anderson, Howard H.; Moyer, Rudolph H.; Sibbett, Donald J.; and Sutherland, David C., to Geomet, Incorporated. Air pollution determination by mercury air sampling. 3,640,624, Cl. 356-36.

Anderson, Orin M. Refuse disposal transfer station. 3,640,411, Cl. 214-41.

Anderson, Richard C., to General Electric Company. Transparent zirconia-, hafnia-, and thoria-rare earth ceramics. 3,640,887, Cl. 252-301.1

Anderson, Richard W.; and Frick, Hughie R., to Dow Chemical Company, The. Synthesis of cyanuric fluoride. 3,641,020, Cl. 260-248.

Anderson, Roland M. Method and construction of a ski boot. 3,640,003, Cl. 36-2.5

Anderson, Yngve R.; and Escott, George K., to Canadian Structural Clay Association. Means for prefabricating brick panels. 3,640,046, Cl. 52-749.

Ando, Sadanao, to Kabushiki Kaisha Ricoh. Sealing for underwater camera housing. 3,640,424, Cl. 220-46.

Anello, Louis G.; Boghosian, Edward Michael; Jones, Edward S.; Minhas, Pritam S.; Price, Alson K.; and Sweeney, Richard F., to Allied Chemical Corporation. Chromium complexes of fluoroisoalkoxyalkyl carboxylic acids. 3,641,083, Cl. 260-438.5

Angelucci, Thomas L., to Kulicke and Soffa Industries, Inc. Heated semiconductor bonding tool. 3,641,304, Cl. 219-85.

Angier, Derek J.: *See*—
Cahn, Robert P.; and Angier, Derek J.,3,641,183.

Anner, Georg; and Ehmann, Ludwig, to Ciba Corporation. Halogenpregnadienes. 3,641,070, Cl. 260-397.45

Anner, Georg; and Meystre, Charles, to Ciba Corporation. 6-Fluoro steroids of the androstane series. 3,641,069, Cl. 260-397.45

Ansuini, Frank Joseph; Schramm, Jacob; and Badia, Frank Arthur. Two phase nickel-zinc alloy. 3,640,781, Cl. 148-12.7

Antrobus, Robert E.: *See*—
Bauman, Joseph F.; Kurtz, Edward, Jr.; Cini, Adrian V.; and Antrobus, Robert E.,3,640,312.

Aoki, Hachiro: *See*—
Isobe, Hiroshi; Aoki, Hachiro; and Tanaka, Noritoshi,3,640,258.

Apparatus for wet treatment of photographic film: *See*—
Waschk, Fritz; Muller, Jurgen; Krieger, Heinrich; and Heindrich, Gunter, 3,640,205.

Applications Unlimited, Inc.: *See*—
Walker, Harold L., 3,640,630.

Aptek Industries, Inc.: *See*—
Knapp, Philip B., 3,640,428.

Arai, Humio: *See*—
Ogawa, Masao; Enjoji, Teruyuki; and Arai, Humio,3,640,914.

Araki, Shinichi: *See*—
Susuki, Rinnosuke; Hoshi, Hiroshi; and Araki, Shinichi,3,640,470.

Arbed S. A.: *See*—
Volbach, Heinz; and Van Driessche, Oscar Julien, 3,640,507.

Arcesi, Joseph A.; and Rauner, Frederick J., to Eastman Kodak Company. Light-sensitive polysulfonates reaction product of aromatic disulfanyl chloride and bisphenol containing styryl ketone group. 3,640,722, Cl. 96-115.

Archer, Harold B.: *See*—
Florsheim, Leonard S., Jr.; Lieberman, David A.; Archer, Harold B.; and Nothmann, Gerhard A.,3,640,623.

Arenco Aktiebolag: *See*—
Axelsson, Sabud, 3,640,244.

Ares, Roland A., to American Standard Inc. Cold-heat recovery for air conditioning. 3,640,090, Cl. 62-436.

Argabright, Perry A.; and Rider, Harold D., to Marathon Oil Company. Low molecular weight polyisocyanates. 3,641,024, Cl. 260-248.

Argoudelis, Alexander D.; and Coats, John H., to Upjohn Company, The. Methods and compositions for treating bacterial amprotozoan infections. 3,641,244, Cl. 424-181.

Argus Chemical Corporation: *See*—
Brecker, Lawrence R.; and Thee, Alfred, 3,640,953.

Arima, Yasutaka: *See*—
Yamada, Keisho; Nagai, Shigeki; Odan, Kyoji; Arima, Yasutaka; and Hidaka, Mikio,3,641,101.

Arimura, Tohru; Kamata, Masamoto; Okado, Masaru; and Ichimaru, Takarokuro, to Nippon Kokan Kabushiki Kaisha. Method of computer control of rolling mills. 3,641,325, Cl. 235-151.1

Arlt, Dieter; and Handschuh, Volkmar, to Farbenfabriken Bayer Aktiengesellschaft. Preparation of isocyaates. 3,641,094, Cl. 260-453.

Armbruster, Frederick Carl; and Jacaway, William Arthur, Jr., to CPC International Inc. Procedure for production of alpha-cyclodextrin. 3,640,847, Cl. 195-31.

Armco Steel Corporation: *See*—
Brown, Edward L., 3,640,326.
Haney, Eugene E., 3,640,776.

Armel, Jack; Kogan, Mark; and Cohen, Howard S., to ISO Nuclear Corporation, mesne. Conveyor system for the uniform exposure of articles or materials to a source of gamma or the like radiation. 3,641,342, Cl. 250-52.

Armitage, Charles H.; Peek, Henry L.; and Pflanz, Herbert M., to Allis-Chalmers Manufacturing Company. Arc chute plates for air circuit breaker. 3,641,293, Cl. 200-144.

Armitage, Charles H.; Peek, Henry L.; and Pflanz, Herbert M., to Allis-Chalmers Manufacturing Company. Arc chute for air circuit breaker. 3,641,294, Cl. 200-144.

Armstrong Cork Company: *See*—
Bagley, Donald H.; and Cook, Robert G., 3,639,959.
Gilbo, Charles F.; and Johnson, Norman A., 3,640,045.
Nute, Ernest B., Jr.; and Ollinger, James C., 3,640,557.

Arnold, Evelyn S.: *See*—
Arnold, Lucius P.; by Arnold, L. P.; and Arnold, Evelyn S., heirs,3,640,025.

Arnold, Lucius P.; by Arnold, L. P.; and Arnold, Evelyn S.; heirs, to Williamson, J. E. (Johnnie). Workpiece advancing means. 3,640,025, Cl. 51-215.

Art Metal-Knoll Corporation: *See*—
Morrison, Andrew Ivar; and Hannah, Bruce R., 3,640,576.

Artz, Walter M.; Cornelius, Kenneth R.; Olson, John W.; Signor, Gary R.; and Slojkowski, Francis E., said Artz, said Cornelius, said Olson & said Slojkowski, assors. to Bell Telephone Laboratories, Incorporated, and said Signor, assor. to Western Electric Company, Incorporated. Multiprocessor computer adapted for partitioning into a plurality of independently operating systems. 3,641,505, Cl. 340-172.5

Arvin Industries, Inc.: *See*—
Ganske, Kingston E., 3,641,265.
Ganske, Kingston E., 3,641,279.

A/S Modulex: *See*—
Christiansen, Godtfred K., 3,640,017.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Hashiguchi, Yasuhisa; and Kamada, Sueo, 3,641,105.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Nomura, Katsuhiko, 3,640,202.

Asano, Shinji: *See*—
Taguchi, Youichi; and Asano, Shinji,3,640,797.

Ashbrook Corporation: *See*—
Albritton, George Washington, 3,640,514.

Ashdee Corporation: *See*—
Koch, Robert L., II.; and Tredwell, Gilman, 3,640,814.

Ashland Oil, Inc.: *See*—
Culbertson, Billy M.; McKillip, William J.; and Sedor, Edward A., 3,641,145.
McKillip, William J.; Culbertson, Billy M.; and Impola, Clarence N., 3,640,676.

Ashley, Albert H., to Sylvania Electric Products, Inc., mesne. Memory system. 3,641,519, Cl. 340-174.

Ashlow Steel & Engineering Company Limited: *See*—
Ashton, George Walker; and Ashton, John Congreve, 3,640,109.

Ashton, George Walker; and Ashton, John Congreve, to Ashlow Steel & Engineering Company Limited, and Templeborough Rolling Mills Limited. Methods of and apparatus for setting roller guides in rod mills. 3,640,109, Cl. 72-37.

Ashton, John Congreve: *See*—
Ashton, George Walker; and Ashton, John Congreve,3,640,109.

Ashton, Walter G., to Star Industries, Inc. Self-propelled floor scrubber. 3,639,936, Cl. 15-94.

Ashworth, Edward Arnold: *See*—
Lythe, Revor Wilkinson; and Ashworth, Edward Arnold,3,640,518.

Aslan, Edward E., to Narda Microwave Corporation, The. Near-field radiation monitor. 3,641,439, Cl. 325-363.

Aspinall, David: *See*—
Ibbett, Roland Norman; and Aspinall, David,3,640,625.

Aston, Keith, to Pavelle Corporation, The. Method and apparatus for photographic color printing. 3,640,618, Cl. 355-35.

Ates Componenti Elettronici S.p.A.: *See*—
Cavallari, Eugenio, 3,641,267.

Atlantic Richfield Company: *See*—
Miller, Virgil A., 3,640,860.
Voelz, Frederick L., 3,640,255.
Yoo, Jin Sun; and Koncos, Robert, 3,641,188.

Atlas Chemical Industries, Inc.: *See*—
Cear, Stanley, 3,640,920.
Masco, Howard L., 3,641,242.
Restaino, Alfred J., 3,640,897.
Stockburger, George J., 3,641,219.

Attaway, Thomas J. Vehicle grounding clamp. 3,641,473, Cl. 339-14.

Audesse, Emery G.; Griffin, Robert M.; Tartakoff, Alexander; and Gutta, John J., to Sylvania Electric Products, Inc. Tungsten halogen lamp. 3,641,386, Cl. 313-179.

Auer, John H., Jr.; and Huffman, Jerry P., to General Signal Corporation. Remote control apparatus. 3,641,575, Cl. 343-225.

Auer, Louis J. Filler tube construction for gasoline tank. 3,640,425, Cl. 220-86.

Automobiles Peugeot: *See*—
Colinet, Andre; Mercier, Jacques; and Pernoud, Claude, 3,640,457.

Automotive Products Company Limited: *See*—
Utton, Norman, 3,640,364.

Avant Incorporated: *See*—
Kuhns, Roger J., 3,640,161.

Avco Corporation: *See*—
Grubba, Donald C., 3,640,757.

Avedis Zildjian Avedis Company: *See*—
Zildjian, Robert, 3,640,029.

Avena, Salvatore: *See*—
Leiner, Robert L.; and Avena, Salvatore,3,640,150.

Avery, Lowell R.; and Conklin, Wayne A., to Dow Chemical Company. Corrosion inhibitor system for functional fluids. 3,640,873, Cl. 252-87.

Aweimrine, Kamal Y. Mechanical lock cylinder. 3,640,139, Cl. 74-89.15

Axelson, Sabud, to Arenco Aktiebolag. Glue transferring device. 3,640,244, Cl. 118-212.

Axtmann, Adam, to Maschinenfabrik Lorenz AG. Punching apparatus. 3,640,167, Cl. 83-380.

Ayad, Karl, to Monsanto Chemicals Limited. Nitramino pyridine derivatives. 3,641,042, Cl. 260-296.

Ayerst, McKenna and Harrison, Limited: *See*—
Davis, Martin A.; and Dobson, Thomas A., 3,641,038.

Baba, George P.: *See*—
Guinn, Frank; and Baba, George P.,3,640,242.

Baba, Theodore B. Continuous process for the production of alfin polymers by polymerization of alfin monomers in an organic solvent and for recovering and recycling solvent. 3,640,978, Cl. 260-82.1

Baba, Theodore B. Continuous process for the production of alfin polymers by polymerization of alfin monomers in an organic solvent and for recovering and recycling solvent. 3,640,979, Cl. 260-82.1

Baba, Theodore B., to National Distillers and Chemical Corporation. Continuous process for the production of alfin polymers by polymerization of alfin monomers in an organic solvent and for recovering and recycling. 3,640,980, Cl. 260-82.1

Babcock & Wilcox, Limited: *See*—
Pacault, Pierre H.; and Dostantni, Albert, 3,640,339.

Babler, Egon S., to Teletype Corporation. Shift control. 3,641,262, Cl. 178-25.

Bacha, John D.; and Selwitz, Charles M., to Gulf Research & Development Company. 1,3,5-Haloxylene extraction. 3,641,168, Cl. 260-650.

Bachman, Gustave B.; and Tullman, Gerald M., to Purdue Research Foundation. Process for the preparation of alkenyl esters. 3,641,122, Cl. 260-497.

Backlund, Peter Stanley, to Union Oil Company of California. Fertilizer urea solutions containing micronutrients. 3,640,698, Cl. 71-29.

Badewitz, Albert R., to Beltron, Inc. Device for restoring cathode emission in cathode-ray tube guns. 3,641,391, Cl. 316-28.

Badia, Frank Arthur: *See*—
Ansuini, Frank Joseph; Schramm, Jacob; and Badia, Frank Arthur,3,640,781.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See*—
Adolphi, Heinrich; Steimmig, Anna; and Spaenig, Hermann, 3,641,248.
Distler, Harry; and Widder, Rudi, 3,641,072.
Gaeth, Rudolf; Stastny, Fritz; Breu, Rudolf; and Gaertner, Friedhelm, 3,640,837.
Krauch, Carl Heinrich; and Sanner, Axel, 3,640,753.
Meissner, Joachim, 3,640,127.
Platz, Rolf; and Merger, Franz, 3,641,117.
Platz, Rolf; and Merger, Franz, 3,641,118.
Reinhard, Hans; Petri, Rolf; and Beckerle, Wilhelm-Friedrich, 3,640,912.
Ricker, Ernst; Schmidt, Franz; and Schwartz, Erich, 3,640,945.
Sander, Bruno; Schmidt, Franz; and Sperber, Heinrich, 3,641,196.
Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgag; Fessmann, Heinz; and Hahn, Edeleried, 3,640,063.
Sturm, Hans-Jurgen; and Mayer, Kurt, 3,640,996.

Backken, Asbjorn, to Canada, Her Majesty the Queen in the right of, as represented by the Minister of National Defence, mesne. Ship-borne conveying means. 3,640,490, Cl. 244-116.

Bagley, Donald H.; and Cook, Robert G., to Armstrong Cork Company. Glass fiber cord rubber roller. 3,639,959, Cl. 29-132.

Bahmsen, Gerhard I.W. Magnetic flash gun mount. 3,641,337, Cl. 240-52.15

Bahouth, Tayseer George: *See*—
Januszewski, Joseph Paul; and Bahouth, Tayseer George,3,641,238.

Bahr, Ulrich: *See*—
Thoma, Wilhelm; Oertel, Harald; Rinke, Heinrich; and Bahr, Ulrich,3,640,937.

Bailey, David L.; and Hinz, Harry C., Jr., to International Business Machines Corporation. Intra-record resynchronization. 3,641,526, Cl. 340-174.1

Bailey, Robert F., to TRW Semiconductors Inc. Semiconductor devices with diffused platinum. 3,640,783, Cl. 148-186.

Baker, George W. Apparatus for expanding a cylindrical vacuum cooling chamber. 3,640,419, Cl. 220-5.

Bakker, Nicolaas, to Chevron Research Company. C-alkyloxy substituted tert.-butyl amine as lubricating oil detergent. 3,640,855, Cl. 252-32.7

Bakker, Wate T., to General Refractories Company. High alumina refractories. 3,640,739, Cl. 106-65.

Baldwin, Arnold V.: *See*—
Smith, Edward A.; and Baldwin, Arnold V.,3,640,392.

Bales, Walter D.: *See*—
Grant, Jon H.; and Bales, Walter D.,3,641,365.

Ball, Alan; Hayes, Barry James; and Matthews, Albert John, to Ciba Limited. Curable compositions containing an epoxide resin and a copolymer of an olefine hydrocarbon with an olefine ester. 3,641,195, Cl. 260-837.

Ball Corporation: *See*—
McKee, James R.; and Chastain, James K., 3,640,039.

Ballard, Louis M.: *See*—
McInnis, Andrew M.; Ballard, Louis M.; Rogers, Waldo I.; Kramer, David C.; and Nielsen, Robert A.,3,639,990.

Balle, Gerhard; and Kolb, Gunter, to Farbenfabriken Bayer Aktiengesellschaft. Process of preparing chloromethyl esters of α,β-unsaturated carboxylic acids. 3,641,119, Cl. 260-486.

Balm Paints Limited: *See*—
Clarke, Michael Raymond; and Filipowicz, Leon, 3,640,931.

Balmes, Michael J., to Graflex, Inc., mesne. Plastic reinforcing edging for picture receiving screen. 3,640,603, Cl. 350-124.

Bancroft, Joseph, & Sons Co.: *See*—
Trifunovic, Alexander L.; Hodges, James R.; and Shick, Richard L., 3,641,234.

Bancroft Racket Company: *See*—
Davis, Tyler B., 3,640,533.
Bandimere, John C. Valve spring tester. 3,640,129, Cl. 73-119.
Bandy, Lyle E.: *See*—
Bitzer, Donald L.; Bandy, Lyle E.; Johnson, Roger L.; and Skaperdas, Dominic O.,3,641,529.
Banfield, Joseph Henry: *See*—
Vossen, John Louis, Jr.; and Banfield, Joseph Henry,3,640,812.
Banks, William P.: *See*—
McDonald Edward Harvey; and Banks, William P.,3,640,802.
Bar Investment Company, Inc.: *See*—
Bowie, John S., 3,640,513.
Barber, James: *See*—
Lesher, John C., 3,641,539.
Barber, Walter G.: *See*—
Loxley, Ted A.; Webb, John M.; and Barber, Walter G.,3,640,398.
Barclay, Allan Sangster, to Steel Company of Canada, Limited, The. Ballistic shape punch and screw head socket. 3,640,175, Cl. 85-45.
Bargman, Dale L., Jr., to Colorado Leisure Products, Inc. Cross drive for lift jack apparatus. 3,640,502, Cl. 254-45.
Barnes Engineering Company: *See*—
Schwarz, Frank, 3,641,348.
Barnes, Randolph C., to Caterpillar Tractor Company. Hydraulic safety override valve. 3,640,146, Cl. 74-364.
Barnett, Richard C., to General Electric Company. Combustor means for pressurized gas-fired space heater. 3,640,264, Cl. 126-110.
Bart, Ronald K.: *See*—
Kiovsky, Joseph R.; and Bart, Ronald K.,3,641,095.
Barth, Walter J., to Du Pont de Nemours, E. I., and Company. Coatings for automotive exhaust gas reactors. 3,640,755, Cl. 117-71.
Bartlett, Lawrence C.: *See*—
Humphriss, Wesley D.; and Bartlett, Lawrence C.,3,640,708.
Bartos, Jon .: *See*—
Robertshaw, Fred C.; Bartos, Jon .; Hurst, James J.; and McGurty, James August,3,640,704.
Baseler, Wolfgang. Resilient interconnection arrangement for rails to cross ties. 3,640,460, Cl. 238-349.
BASF Wyandotte Corporation: *See*—
Cenker, Moses, 3,640,886.
Fijal, Walter R., 3,640,997.
Basic Incorporated: *See*—
Jepsen, Tag L. B., 3,640,382.
Bastian, Donald Lee, to Western Kraft Corporation. Tray forming carton. 3,640,449, Cl. 229-44.
Bath, James Reynolds. Automatic anti-collision and accident marker system for automotive vehicle. 3,641,491, Cl. 340-61.
Battelle Development Corporation, The: *See*—
Javet, Alain, 3,640,330.
Johnson, Harry T., 3,640,651.
Batzer, Hans: *See*—
Porret, Daniel; Habermeier, Juergen; and Batzer, Hans,3,640,910.
Schmid, Rolf; Bucher, Ingrid; Fisch, Willy; and Batzer, Hans,3,641,194.
Bauer, Eddie, Inc.: *See*—
McGuire, William L., 3,639,931.
Bauer, William, Jr.: *See*—
Niederhauser, Warren Dexter; Belmares-Sarabia, Hector; and Bauer, William, Jr.,3,641,199.
Bauer, William W. Hand device for basketball players. 3,640,532, Cl. 273-1.5.
Bauman, Joseph F.; Kurtz, Edward, Jr.; Cini, Adrian V.; and Antrobus, Robert E., to Acme-Hamilton Manufacturing Corporation. Flexible corrugated tubing having improved performance characteristics. 3,640,312, Cl. 138-121.
Baxter Laboratories, Inc.: *See*—
Bhatia, Surindar Kumar; and Memhardt, Charles Rogers, 3,640,283.
Leonard, Ronald James; and Cohen, Fred Michael, 3,640,340.
Bayard, Robert T.: *See*—
Shank, Richard C.; Zucker, Carl E.; Jones, David H.; Ribbq Harry F.q Jr.; and Bayard, Robert T.,3,640,844.
Baybarz, Russell D.; and Peterson, Joseph R., to United States of America, Atomic Energy Commission. Californium-252 neutron source and method of making same. 3,640,888, Cl. 252-301.1
Baychem Corporation: *See*—
Rawlings, Herbert L., 3,640,951.
B&B Pipul, Inc.: *See*—
Brighton, Jack Edward, 3,639,967.
B.D.H. Chemicals Limited: *See*—
Hayman, David Frank; and Wild, Anthony Musgrave, 3,641,123.
Beaman, Alden Gamaliel; Duschinsky, Robert; and Tautz, William Paul, to Hoffman-La Roche Inc. 2-Nitroimidazole derivatives substituted in the 1- position with a 2-oxo-propyl or semicarbazone group. 3,641,047, Cl. 260-309.
Bearfield, Clair A.: *See*—
Wieland, Roman G.; Weber, A. John; Bearfield, Clair A.; and Cole, Raymond,3,640,520.
Beattie, Willard H.; and Gallaway, William S., to Beckman Instruments, Inc. Apparatus for measuring scattered light. 3,640,627, Cl. 356-104.
Beaumont Birch Company: *See*—
Reiner, Joel Russell; Preusch, William J.; and Davenport, William G., 3,640,233.
Beavers, Dorothy J.: *See*—
Gates, John W., Jr.; Wise, Albert W.; Beavers, Dorothy J.; and Miller, Paul E.,3,641,046.
Beck, Christian A., to Pitney-Bowes, Inc. Copy sheet handling apparatus for electrostatic office copiers. 3,640,523, Cl. 271-28.
Beck, Cyrus, to United States of America, Navy. Real time image contrast and edge sharpness enhacing apparatus. 3,641,268, Cl. 178-7.3
Beck, Fred R.; Fanella, Robert J.; and Gioia, Norman F., to Ampex Corporation. Tape reel and tape threading system. 3,640,483, Cl. 242-74.1
Beck, George R. Ornamental scarf clip. 3,639,949, Cl. 24-49.0
Beck, William P.: *See*—
Jackson, Wilbur C.; and Beck, William P.,3,639,984.
Becker, Gunter E., to Xerox Corporation. Lowering device. 3,640,406, Cl. 214-6.
Beckerle, Wilhelm-Friedrich: *See*—
Reinhard, Hans; Petri, Rolf; and Beckerle, Wilhelm-Friedrich,3,640,912.
Beckman, Eugene B.: *See*—
Costello, Raymond M.; and Beckman, Eugene B.,3,640,250.
Beckman Instruments, Inc.: *See*—
Beattie, Willard H.; and Gallaway, William S., 3,640,627.
Becraft, Donald E., to Hendry, C. J., Company. System and method for hoisting submarine hose. 3,640,400, Cl. 212-3.
Beecham Group Limited: *See*—
Love, Dennis Anthony; Neal, David Patrick John; and Pidgeon, Eric, 3,641,001.
Beersma, Pieter Johannes Adrianus; and Veening, Albert Hendrik, to Scholten Research N.V. Remoistenable pregummed products. 3,640,756, Cl. 117-76.
Beier, Werner E.: *See*—
Paliyenko, Paul; and Beier, Werner E.,3,640,670.
Beisemann, Manfred, to Konings, P., Machinefabriek, Firma. Means utilizing compressed air for confining a pressurized oil film between relatively movable bearing surfaces. 3,640,590, Cl. 308-9.
Bell & Howell Company: *See*—
Browder, Lewis B., 3,641,280.
Fredrickson, Donald M., 3,640,524.
Fredrickson, Donald M.; and Bungener, Johannes H., 3,640,617.
Hodder, Wayne K., 3,641,468.
Koeber, Henry J.; and Pendulous range finding device, 3,639,997.
Nupnau, Arthur E., 3,640,612.
Bell, Joseph P. Pallet. 3,640,229, Cl. 108-58.
Bell Punch Company Limited: *See*—
Lloyd, John George; and Fripp, Alan, 3,641,501.
Bell Telephone Laboratories, Incorporated: *See*—
Copeland, John Alexander, III, 3,641,518.
Irish, Carleton D.; and Painkin, Harold, 3,641,475.
Paoli, Thomas L.; and Ripper, Jose'E., 3,641,459.
Perks, Arthur Francis, 3,641,463.
Robbins, Murray; and Wolfe, Raymond, 3,640,864.
Bell Telephone Laboratories, Incorporated, and said Signor, assor. to Western Electric Company, Incorporated: *See*—
Artz, Walter M.; Cornelius, Kenneth R.; Olson, John W.; Signor, Gary R.; and Slojkowski, Francis E., 3,641,505.
Belmares-Sarabia, Hector: *See*—
Niederhauser, Warren Dexter; Belmares-Sarabia, Hector; and Bauer, William, Jr.,3,641,199.
Belohoubek, Erwin F., to United States of America, Navy, mesne. Microwave delay apparatus. 3,641,388, Cl. 315-3.5.
Beloit Corporation: *See*—
Justus, Edgar J., 3,639,956.
Beltron, Inc.: *See*—
Badewitz, Albert R., 3,641,391.
Bencze, William Laszlo, to Ciba Corporation. Phenoxy-aliphatic acids. 3,641,110, Cl. 260-473.
Bendix Corporation: *See*—
Green, Norman; Greenhouse, Harold M.; Vergara, William C.; and McGill, Robert L., Jr., 3,641,372.
Stauffer, Reuben Laverne, 3,641,423.
Bendix Corporation, The: *See*—
Carp, Ralph W.; and Miesterfeld, Frederick O., 3,640,588.
Coman, William E., 3,641,392.
Giardini, Dante S.; Preston, George A.; and Roney, Richard N., 3,640,163.
Kasselmann, John T., 3,640,184.
Knopf, George S., 3,641,535.
Sylvander, Frederick B., 3,641,533.
Yates, Lester R.; Dorsey, Charles M., Jr.; Howell, John B.; Conklin, Winfred S.; Sawicki, Joseph J.; Shepherd, Reeves T.; and Soares, Silvio, 3,641,434.
Benediti, Lena: *See*—
Freismuth, John S.; and Benediti, Nello L.,3,640,454.
Benediti, Nello L.: *See*—
Freismuth, John S.; and Benediti, Nello L.,3,640,454.
Bennett, Arthur D. Retainer for punch and die sets. 3,640,170, Cl. 83-698.
Bennett, Moreland P. Tab welded joint and method of making. 3,640,556, Cl. 287-189.36.
Benoit, Henry F. Rag feeder. 3,640,377, Cl. 198-178.
Benson, Charles R.: *See*—
Kossen, Dale J.; Foster, Richard W.; and Benson, Charles R.,3,641,396.

Bentley, Floyd Edward; and Godfrey, Norman Bell, to Jefferson Chemical Company, Inc. Accelerator combination for epoxy curing. 3,639,928, Cl. 260-47.

Benz, Gerhard: *See*—
Seppala, Harold J.; and Benz, Gerhard,3,640,944.

Berberich, Norbert J., Jr.: *See*—
Cook, Elton S.; and Berberich, Norbert J., Jr.,3,641,247.

Berezowski, Jaroslaw, to Sealectro Corporation. Electro-mechanical keyboard independently operated switch mechanism with improved conductive resilient actuating means. 3,641,286, Cl. 200-5.

Berk Limited: *See*—
Holman, Donald John, 3,641,087.

Berrie, Alistair Howard; and Hughes, Nigel, to Imperial Chemical Industries Limited. Process for colouring synthetic textile materials with monoazo dyestuff dispersions. 3,640,674, Cl. 8-41.

Berry, Edward J.: *See*—
Lutzen, William C.; and Berry, Edward J.,3,640,104.

Berthold, H., Messinglinienfabrik und Schriftgiesserei AG: *See*—
Linde, Hans; and Thienel, Peter, 3,640,193.

Bertin & Cie: *See*—
Bertin, Jean Henri, 3,640,486.

Bertin, Jean Henri, to Bertin & Cie. Flying wing having ground-effect take-off and landing. 3,640,486, Cl. 244-12.

Bethlehem Steel Corporation: *See*—
Gault, Robert H., 3,640,342.
Nusbickel, Edward M., Jr., 3,640,122.

Betts, Max William; and Robinson, Frank, to Courtaulds Limited. Knitting methods. 3,640,096, Cl. 66-176.

Betts, Max William; and Robinson, Frank, to Courtaulds Limited. Knitting method. 3,640,097, Cl. 66-176.

Bhatia, Surindar Kumar; and Memhardt, Charles Rogers, to Baxter Laboratories, Inc. Disposable blood warming container. 3,640,283, Cl. 128-399.

Biancardi, Frank R.; and Melikian, Gorken, to United Aircraft Corporation. Modified open cycle gas laser system. 3,641,453, Cl. 331-94.5.

Bianchi, Vittorio Louis Achille. Hydraulic device for moving in translation the pressing element of a press or the like. 3,640,211, Cl. 100-258.

Bielicki, Marvin S.: *See*—
Martin, William A.; and Bielicki, Marvin S.,3,641,282.

Bilderback, John W., to Goodyear Tire & Rubber Company, The. Method of processing powdery accelerators prepared in an aqueous medium. 3,640,975, Cl. 260-79.5.

Bilow, Norman. Ferrocene-phthalaldehyde copolymers. 3,640,961, Cl. 260-67.

Bilow, Norman; and Rosenberg, Harold, to United States of America, Air Force. Cured polyferrocenylenes and process for curing. 3,640,959, Cl. 260-64.

Bilow, Norman; and Rosenberg, Harold, to United States of America, Air Force. Process for curing polyferrocenylenes. 3,640,963, Cl. 260-67.

Biranowski, Jerome B.; and Weil, Edward D., to Stauffer Chemical Company. Unsaturated polyester compositions containing vinyl polyphosphonate compounds. 3,641,202, Cl. 260-859.

Bird Machine Company: *See*—
Nichols, George E., Jr., 3,640,760.

Bishop, Nigel Douglas; and Masters, Joan Irene, to Imperial Chemical Industries Limited. Pesticidal compounds and compositions containing them. 3,641,035, Cl. 260-256.4.

Bittscheidt, Josef: *See*—
Michels, Aldred; and Bittscheidt, Josef,3,640,919.

Bitzer, Donald L.; Bandy, Lyle E.; Johnson, Roger L.; and Skaperdas, Dominic O., to University of Illinois Foundation. Radial and circumferential magnetic head positioning mechanism. 3,641,529, Cl. 340-174.1.

Bizzarri, Venanzio, to Aktiebolaget Kanthal. Shaped bodies resistant to oxidation, particularly electric resistance elements. 3,640,907, Cl. 252-521.

Black and Decker Manufacturing Company, The: *See*—
Vick, Stephen L., 3,641,379.
Vogelsberg, Walter H., 3,641,410.

Blackburn, Richard D., to General Electric Company. High-low voltage level sensor. 3,641,546, Cl. 340-248.

Blanc, Jean-Henry: *See*—
Reulet, Philippe; Pfister, Alain; Tellier, Jacques; Blanc, Jean-Henry; Jorgensen, Kirsten Borre; and Bohlbro, Hans,3,641,102.

Blatt, Leland F. Shielded air hose swivel with safety push button disconnect. 3,640,553, Cl. 285-277.

Blattner, Hans: *See*—
Schindler, Walter; and Blattner, Hans,3,641,056.

Block, Irwin H.: *See*—
Altman, Murray; Craig, Mordecai R.; and Block, Irwin H.,3,640,010.

Blohm, Thomas R.: *See*—
Tilford, Charles H.; Blohm, Thomas R.; and MacKenzie, Robert D.,3,641,155.

Blount, Charles, Jr.; and Crandall, Nelson, to United Piece Dye Works, The. Winch apparatus for treating material in strand form. 3,640,102, Cl. 68-176.

Blum, Bernard; and Schwartzenberg, John W., to Leeds & Northrup Company. Carbon content measurement in a basic oxygen furnace. 3,640,119, Cl. 73-23.

Blumenfeld, Georg, to Dynamit Nobel Aktiengesellschaft. Cyclic hydroxyacetals. 3,641,059, Cl. 260-340.6.

Bobrick Aero-Missile Products: *See*—
Vogt, Clarence L., 3,640,306.

Bock, Otto, Orthopadische Industrie KG., Firma: *See*—
Munch, Josef, 3,639,927.

Bode, Klaus-Dieter; and Schellhammer, Carl-Wolfgang, to Farbenfabriken Bayer Aktiengesellschaft. 7-Triazinyl-coumarins. 3,641,023, Cl. 260-248.

Bodley, Roger W.: *See*—
Zimmerman, Burton R.; Bodley, Roger W.; and Goodman, Robert C.,3,640,195.

Boehringer, C. H. Sohn: *See*—
Ost, Walter; Thomas, Klaus; Jerchel, Dietrich; and Linden, Gerbert, 3,641,062.

Boghosian, Edward Michael: *See*—
Anello, Louis G.; Boghosian, Edward Michael; Jones, Edward S.; Minhas, Pritam S.; Price, Alson K.; and Sweeney, Richard F.,3,641,083.

Boguslawski, Jan J., to Fabric Tire Hose Company. Apparatus for continuous manufacture of reinforced hose. 3,640,656, Cl. 425-113.

Bohlbro, Hans: *See*—
Reulet, Philippe; Pfister, Alain; Tellier, Jacques; Blanc, Jean-Henry; Jorgensen, Kirsten Borre; and Bohlbro, Hans,3,641,102.

Boin, Giovanni. Electric lamps for emergency and/or for duty under particular environment conditions, and relative improved lamps. 3,641,336, Cl. 240-10.6.

Bolger, Bernard Joseph; and O'Sullivan, Denis Joseph. Adhesive compositions comprising 2-cyanoacrylates and heterocyclic compounds. 3,640,972, Cl. 260-78.4.

Bolt Beranek and Newman Inc.: *See*—
Allen, Clayton H.; and Heine, John C., 3,640,539.
Allen, Robert J.; and Novack, Robert Lee, 3,640,773.
Juda, Walter; Allen, Robert J.; and Petrow, Henry G., 3,640,774.

Bolt, Gregory L.; Brandt, Charles H.; McLain, Aubrey R.; and Patel, Jayantilal M., to Procter & Gamble Company, The. Flavor robusta coffee. 3,640,726, Cl. 99-68.

Bond, Donald S., to RCA Corporation. Radio postal system acknowledgement apparatus. 3,641,432, Cl. 325-4.

Bonhomme, Francois Robert, to Connectronics Corporation. Sockets for prong socket electrical contacts and in their methods of manufacture. 3,641,483, Cl. 339-217.

Bonin, Pete J.: *See*—
Hussey, Joseph L., 3,640,272.

Bonvicini, Alberto; and Cantatore, Giuseppe, to Montecatini Edison S.p.A. Process for preparing substituted 1,4- diazacycloheptanes. 3,640,999, Cl. 260-239.

Booth, Frank B., to Union Oil Company of California. Catalyst recovery. 3,641,076, Cl. 260-429.

Boothe Airside Services, Inc.: *See*—
Eggert, Walter S., Jr., 3,639,934.

Boothe, Willis A.; and Bottone, Salvatore, Jr., to United States of America, Air Force. Fluid amplifier frequncy multiplier. 3,640,300, Cl. 137-81.5.

Borden Company, The: *See*—
Winslow, Alfred Edwards; and Spicer, John Calvin, 3,640,841.

Borden Corporation, The: *See*—
McKee, Lewis W.; and Feest, Robert H., Jr., 3,640,593.

Borg-Warner Corporation: *See*—
Hopkins, Neil E.; and Muench, Paul W., 3,640,084.

Borkhuis, James R. Emergency gas alarm system. 3,641,541, Cl. 340-237.

Borsboom, Albertus C. H.: *See*—
Nihof, Hendrikus J.; and Borsboom, Albertus C. H.,3,640,120.

Bosch, Robert, G.m.b.H.: *See*—
Mittag, Hermann; and Isaler, Jorg, 3,640,260.

Bostick, Edgar E.; Gaines, George L., Jr.; and Le Grand, Donald G., to General Electric Company. Polymer-filler composition. 3,640,943, Cl. 260-37.

Bostick, Edgar E.; and Zdaniewski, Joseph J., to General Electric Company. Silanolate-complexes and use thereof. 3,641,090, Cl. 260-448.2.

Boswell, George Albert, Jr.; and Ripka, William Charles, to Du Pont de Nemours, E. I., and Company. Process for the preparation of Δ⁹-6,6-difluoro-3, 20-diketo-17α, 21-dihydroxypregnenes. 3,641,005, Cl. 260-239.55.

Botto, Giuseppe. Apparatus for excavation of deep holes and trenches. 3,640,353, Cl. 175-202.

Bottone, Salvatore, Jr.: *See*—
Boothe, Willis A.; and Bottone, Salvatore, Jr.,3,640,300.

Botts, Marion F.; and Regel, Erik K., to Chemagro Corporation. S,S-dialkyl-amido-dithiophosphates. 3,641,222, Cl. 260-959.

Bouche, Edmund L., to Technical Operations, Incorporated. Diffraction process photography and reconstruction: fidelity enhancement by minimization of cross- talk and moire patterns. 3,640,711, Cl. 96-27.

Boucher, Robert J., to Hughes Aircraft Company. Digital frequency synthesizer. 3,641,442, Cl. 328-14.

Bouchet, Jean, to Creusat-Loire, mesne. Direct reduction of oxides. 3,640,701, Cl. 75-40.

Boudouris, Angelo; Kulish, Stanley J., Jr.; and Plumadore, Harold M., to Eprad Incorporated. Control for motion picture projectors. 3,640,611, Cl. 352-92.

Boustany, Kamel, to Monsanto Company. Certain cycloalkylsulfenamides as prevulcanization inhibitors. 3,640,976, Cl. 260-79.5

Bower, George M. Stabilized polyimidazopyrrolones compositions and method of preparation. 3,640,960, Cl. 260-65.

Bowers, Daniel G., to Eastman Kodak Company. Switch apparatus. 3,641,297, Cl. 200-166.

Bowie, John S., to Bar Investment Company, Inc. Low velocity gas scrubber. 3,640,513, Cl. 261-78.

Bowman, Paul F., to Broach Systems, Inc. Box machine. 3,640,189, Cl. 93-49.

Box, E O., Jr.; and Uhrick, David A., to Phillips Petroleum Company. Highly calcined support for catalytic dehydrogenation. 3,641,182, Cl. 260-680.

Boyce, Alden C., to Rota-Matic, Inc. Method of and apparatus for cooling of rotational casting apparatus. 3,640,338, Cl. 165-48.

Boyer, Jacques, to Societe Rhodiaceta. Double-twist spindle. 3,640,060, Cl. 57-58.84

Brabander, Herbert Joseph: *See*—
Wright, William Blythe, Jr.; and Brabander, Herbert Joseph,3,641,029.

Braddick, Britt O.; Lindsey, Hiram E., Jr.; and McKiearnan, Charles J., to Texas Iron Works, Inc. Apparatus for completing plural zone oil and gas wells. 3,640,341, Cl. 166-115.

Bradshaw, Christopher Patrick Cadman: *See*—
Turner, Leonard; Howman, Eric James; and Bradshaw, Christopher Patrick Cadman,3,641,189.

Braillard, Pierre L.; Moreuil, Jean-Louis; and Steru, Marius, to Compagnie Generale d'Electronique Industrielle Lepaute, CGEI-Lepaute. Man-to-machine peripheral communication device. 3,640,002, Cl. 35-8.

Brandon, Clarence W., to Orpha Brandon. Fracturing and scavenging formations with fluids containing liquefiable gases and acidizing agents. 3,640,344, Cl. 166-307.

Brandt, Charles H.: *See*—
Bolt, Gregory L.; Brandt, Charles H.; McLain, Aubrey R.; and Patel, Jayantilal M.,3,640,726.

Branson, Tony R. Yarn covering apparatus. 3,640,057, Cl. 57-18.

Brawn, Darrell S., to Eaton Yale & Towne Inc. Safety apparatus. 3,640,546, Cl. 280-150.

Brearley Company, The: *See*—
Aleks, Vytant, 3,640,498.

Brecker, Lawrence R.; and Thee, Alfred, to Argus Chemical Corporation. Stabilization of polyvinyl chloride resins. 3,640,953, Cl. 260-45.75

Breda, Ernest J., to Du Pont de Nemours, E. I., and Company. Purification process for unsaturated organic nitriles. 3,641,107, Cl. 260-465.9

Brega, Angelo: *See*—
Piana, Francesco; and Brega, Angelo,3,640,094.

Bremshey & Co., Firma: *See*—
Busse, Fritz, 3,640,228.

Bremshey, Fritz, to Telesco Brophey Limited. Longitudinally collapsible flat umbrella. 3,640,297, Cl. 135-25.

Brescia, Riccardo; and Montanari, Lucio, to Olivetti, Ing., C., & C., S.p.A. Keyboard for calculating machines, teleprinters, terminals and the like. 3,641,568, Cl. 340-365.

Breslow, David S., to Hercules Incorporated. Modifying polymers. 3,640,974, Cl. 260-78.5

Bretting, Klaus, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Plug connector for flat conductor strip line. 3,641,482, Cl. 339-196.

Breu, Rudolf: *See*—
Gaeth, Rudolf; Stastny, Fritz; Breu, Rudolf; and Gaertner, Friedheim,3,640,837.

Brewn, Margery Joy: *See*—
Brown, Warren F., 3,640,279.

Brickley, Alfred H.: *See*—
Halls, Kenneth F.; and Brickley, Alfred H.,3,640,159.

Brighton, Jack Edward, to B&B Pipul, Inc. Pipe joining machine. 3,639,967, Cl. 29-237.

Brignall, Clifford N. Packaging method. 3,640,047, Cl. 53-22.

Brill, Beatrice M.: *See*—
Brill, Eugene L.; and Brill, Beatrice M.,3,640,394.

Brill, Eugene L.; and Brill, Beatrice M. Oil skimmer with oscillatable circular loop. 3,640,394, Cl. 210-322.

Brilman, Michel Edmond Francis; Campagne, Jean-Pierre Alain; and Gorinas, Guy Georges, to Societe Alsacienne de Constructions Atomiques de Telecommunications et d'Electronique 'Alcatel'. Superconductive data storage arrangement. 3,641,517, Cl. 340-173.1

Briskin, Theodore; and Ward, Geoffrey R., to Sutton Research Corporation. Cigarette paper and method for preparation. 3,640,285, Cl. 131-2.

Bristol-Myers Company: *See*—
Dimitroff, Dimiter V., 3,640,659.

British Domestics Appliances Limited: *See*—
Eastall, Martin Harold, 3,640,098.

British Petroleum Company Limited, The: *See*—
Forbes, Alan David; and Hunter, Neville John, 3,640,893.
Turner, Leonard; Howman, Eric James; and Bradshaw, Christopher Patrick Cadman, 3,641,189.

British Railways Board: *See*—
Tustin, Arnold; and Sell, Richard Geoffrey, 3,641,285.

Britt, Jack; and Honey, Alfred John, to Rolls-Royce Limited. Axial flow compressor. 3,640,638, Cl. 415-172.

Broach Systems, Inc.: *See*—
Bowman, Paul F., 3,640,189.

Brockett, Peter C.; and Pallat, Ludwig R., to LFE Corporation. Local controller for traffic control system. 3,641,486, Cl. 340-41.

Brode, George Lewis; and Pickering, Timothy Lee, to Union Carbide Corporation. Thermoplastic sulfur-containing polymers. 3,640,965, Cl. 260-77.5

Broderick, Edward J.; and Rein, Burton M., to Mobil Oil Corporation. Process for the production of long chain esters. 3,641,120, Cl. 260-491.

Brody, Herbert M., to American Standard Inc. Refrigerant flow control employing plural valves. 3,640,086, Cl. 62-210.

Brooke, Edric Raymond, to English Numbering Machines Limited. Shim adjustable pressure members for magnetic tape transducing devices. 3,641,283, Cl. 179-100.2

Brooks, David N., to Eastman Kodak Company, mesne. Photographic apparatus. 3,640,196, Cl. 95-11.5

Brooks, Martin Frederick; and Kerrigan, Vincent, to Imperial Chemical Industries Limited. Stable liquid diphenylmethane diisocyanates. 3,641,093, Cl. 260-453.

Brotz, Walter; and Dallmann, Bruno, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Lubricant compositions for masses of polyvinyl chloride and process for making. 3,640,828, Cl. 252-17.

Broughtonq Jesse L.: *See*—
Ernest, Dale S., 3,640,266.

Broverman, Irwin, to Mallory, P. R., & Co., Inc. Electrically conductive material and electrical contact. 3,641,298, Cl. 200-166.

Browder, Lewis B., to Bell & Howell Company. Apparatus for contact copying magnetic records including shield for preventing erasure of the master record. 3,641,280, Cl. 179-100.2

Brown, Clyde O.; and Bullis, Robert H., to United Aircraft Corporation. High performance gas laser. 3,641,457, Cl. 331-94.5

Brown, Dale M.; and Engeler, William E., to General Electric Company. Field-effect transistors with superior passivating films and method of making same. 3,641,405, Cl. 317-235.

Brown, Dale M.; and Garfinkel, Marvin, to General Electric Company. Diffusion masking in semiconductor preparation. 3,640,782, Cl. 148-187.

Brown, Edward L., to Armco Steel Corporation. Bolt. 3,640,326, Cl. 151-37.

Brown, Fred P., Jr.; and Rohdin, Howard A., to Packaging Industries, Inc. Re-entrant forming apparatus. 3,640,668, Cl. 18-35.

Brown, Mervyn: *See*—
Kitching, Anthony George; and Brown, Mervyn,3,640,357.

Brown, Warren F., to Brewn, Margery Joy, and First National Bank of Atlanta, The. Skin graft cutting method and machine. 3,640,279, Cl. 128-305.

Brownawell, Darrell W.: *See*—
Robbins, Max L.; and Brownawell, Darrell W.,3,641,181.

Brownell, Peter, to Fram Corporation. Filter. 3,640,396, Cl. 210-493.

Brudi Equipment, Inc.: *See*—
Brudi, Ronald A., 3,640,414.

Brudi, Ronald A., to Brudi Equipment, Inc. Push-pull attachment for lift trucks. 3,640,414, Cl. 214-514.

Brun, Henri; and Meilleroux, Jean-Louis, to Thomson-CSF. Optical pumping magnetimeters. 3,641,426, Cl. 324-0.5

Brundage, Clinton F.: *See*—
Anastasio, Frank J.; Brundage, Clinton F.; and Strakosch, Clarence P.,3,640,407.

Bruning, Elmer E.: *See*—
Kirwan, Warren J.; and Bruning, Elmer E.,3,639,941.

Bublitz, Donald E., to Dow Chemical Company, The. cyclik substituted derivatives of tricyclohexyltin. 3,641,037, Cl. 260-270.

Bucaram, Salim M.; and Collings, Lawrence V., to Sinclair Oil & Gas Company. Paraffin inhibitor in crude oil with high molecular weight highly branched polyethylene. 3,640,824, Cl. 252-8.3

Buchel, Karl-Heinz; Draber, Wilfried; Hammann, Ingeborg; and Unterstenhofer, Gunter, to Farbenfabriken Bayer Aktiengesellschaft. Cyano substituted phenylhydrazones of 1,2- dicarbonyl compounds. 3,641,098, Cl. 260-465.

Bucher, Ingrid: *See*—
Schmid, Rolf; Bucher, Ingrid; Finch, Willy; and Batzer, Hans,3,641,194.

Buckler, Sheldon A.; and Lambert, Ronald F., to Polaroid Corporation. Photographic processes and compositions therefor. 3,640,713, Cl. 96-29.

Buckley, Herman T., to Dixie Size and Chemical Co. Textile treating composition and process of making same. 3,641,073, Cl. 260-410.6

Buhr Machine Tool Company: *See*—
Harte, Robert B., 3,641,326.

Bull, Willard C.; and Schmid, Bruce K., to Gulf Research & Development Company. Multiple stage process for producing light liquids from coal. 3,640,816, Cl. 208-10.

Bullard, E. D., Company: *See*—
Raschke, Herbert A., 3,640,555.

Buller, Joseph S.; Nagy, Michael J.; and Peterson, Eugene W., to Santa Barbara Research Center. Valve arrangement to provide temperature level control at cryogenic temperature ranges. 3,640,091, Cl. 62-514.

Bullis, Robert H.: *See*—
Brown, Clyde O.; and Bullis, Robert H.,3,641,457.

Bungener, Johannes H.: *See*—
Fredrickson, Donald M.; and Bungener, Johannes H.,3,640,617.

Buning, Robert; Paalf, Hans; and Pungs, Wolfgang, to Dynamit Nobel Aktiengesellschaft. Production of polyvinyl chloride shaped articles. 3,640,930, Cl. 260-23.
Bunting, Henry E.; and Smith, Paul E., to U.S. Electronic Services Corporation. Microcircuit package and method of making same. 3,641,254, Cl. 174-68.5
Buonassisi, Albert J. Hand cart. 3,640,544, Cl. 280-47.35
Burgess, Robert Stuart, to Panaura Limited. Decorative article for reflecting light from a metallized strip onto a fluorescent material. 3,640,795, Cl. 161-3.
Burke, George K.; and Raines, Kenneth, to Burron Medical Products, Inc. Intravenous needle assembly. 3,640,275, Cl. 128-214.
Burke, Richard Lerda: *See*—
Chirash, William; and Burke, Richard Lerda, 3,640,878.
Burleigh, John E.; and Uraneck, Carl A., to Phillips Petroleum Company. Polymerization of cyclic monoolefins. 3,640,986, Cl. 260-93.1
Burnett, Ronald Cyril: *See*—
Horsley, Geoffrey Winton; and Burnett, Ronald Cyril, 3,641,227.
Burns, Gerald; Giess, Edward A.; and O'Kane, Daniel F., to International Business Machines Corporation. Ferroelectric materials process of preparation. 3,640,865, Cl. 252-62.9
Burron Medical Products, Inc.: *See*—
Burke, George K.; and Raines, Kenneth, 3,640,275.
Burroughs Corporation: *See*—
Farnham, Norman W.; Mueller, William J.; and Gorall, Donald J., 3,640,219.
Gyi, Ko Ko, 3,641,527.
Burroughs Wellcome & Co. (U.S.A.), Inc.: *See*—
Phillips, Arthur P.; and Burrows, Robert B., 3,641,012.
Burrows, Robert B.: *See*—
Phillips, Arthur P.; and Burrows, Robert B., 3,641,012.
Burt, John, to Deutsch Fastener Corporation. Fastener with floating nut. 3,640,327, Cl. 151-41.74
Burton & Noonan: *See*—
Burton, Perry E., 3,640,235.
Burton, Perry E., to Burton & Noonan, mesne. Method and apparatus for cutting and hemming cloth lengths. 3,640,235, Cl. 112-121.29
Bush, Henry J., to United States of America, Air Force. Programmed paramagnetic tuning radio receiver using larmor resonance. 3,641,440, Cl. 325-383.
Bush, Richard P., to Midland Silicones Limited. Siloxazanes compositions and processes thereof. 3,641,089, Cl. 260-448.2
Bushnell, David; Fuller, Roger L.; and Oliver, Joseph J., to Raytheon Company. Highway vehicle sensor system. 3,641,569, Cl. 340-38.
Busse, Fritz, to Bremshey & Co., Firma. One-column-table. 3,640,228, Cl. 108-6.
Butterfield, Max E., to Caterpillar Tractor Company. Anti-slip safety surface. 3,640,035, Cl. 52-177.
by Arnold, L. P.: *See*—
Arnold, Lucius P.; by Arnold, L. P.; and Arnold, Evelyn S.; heirs, 3,640,025.
Bydal, Bruce Alfred, to Du Pont de Nemours, E. I., and Company. Apparatus for dividing and recombining flow. 3,640,308, Cl. 137-561.
Cadiou, Jean G., to Citroen S.A. Door stop means. 3,639,943, Cl. 16-82.
Cadle, Peggy Snider. Stackable furniture units. 3,639,924, Cl. 5-2.
Cahn, Robert P.; and Angier, Derek J., to Esso Research and Engineering Company. Injection of an electrically heated stream into a steam cracked product. 3,641,183, Cl. 260-683.
Caillouet, James J., to American Imagination Corporation. Portable computer. 3,640,453, Cl. 235-78.
Cairns, Robert H.Model 'C' watchclock keyholder. 3,640,108, Cl. 70-456.
Calano, Giuseppe: *See*—
Cortona, Alessandro; and Calano, Giuseppe, 3,641,269.
Caldwell, John P., to Xerox Corporation. Imaging system. 3,640,707, Cl. 96-1.4
California Computer Products, Inc.: *See*—
McInnis, Andrew M.; Ballard, Louis M.; Rogers, Waldo I.; Kramer, David C.; and Nielsen, Robert A., 3,639,990.
California Institute of Technology: *See*—
Rembaum, Alan; and Hermann, Allen M., 3,641,470.
California R & D Center: *See*—
Jones, Lawrence Temple; Schmidt, Gerald W.; and Smith, Jay, III, 3,640,019.
Callahan, Francis Marc, to American Cyanamid Company. Mixed anhydride method of preparing peptides. 3,640,991, Cl. 260-112.5
Camie Company, Inc.: *See*—
Campbell, Carl N., 3,640,429.
Campagne, Jean-Pierre Alain: *See*—
Brilman, Michel Edmond Francis; Campagne, Jean-Pierre Alain; and Gorinas, Guy Georges, 3,641,517.
Campbell, Carl N., to Camie Company, Inc. Method of dispensing an industrial spray using both a propellant-dispersant and gas pressure. 3,640,429, Cl. 222-1.
Campbell, Ronald R.; and Monroe, Roger A., to Storage Technology Corporation. File protect system for magnetic tape unit with solenoid for sensing presence or absence of reel ring. 3,641,277, Cl. 179-100.2
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Lachambre, Jean L., 3,641,346.
Canada, Her Majesty the Queen in the right of, as represented by the Minister of National Defence: *See*—
Baekken, Asbjorn, 3,640,490.
Canadian Industries Limited: *See*—
Rowley, Edward Kenneth; and Waugh, Clayton Thomas, 3,640,790.
Canadian International Paper Company: *See*—
Girard, Christian F.; and Derouin, Gerald J., 3,640,125.
Canadian Structural Clay Association: *See*—
Anderson, Yngve R.; and Escott, George K., 3,640,046.
Cant, Noel W.; and Hall, William K., to Gulf Research & Development Company. Ethylene oxidation in the presence of iridium metal. 3,641,139, Cl. 260-533.
Cantatore, Giuseppe: *See*—
Bonvicini, Alberto; and Cantatore, Giuseppe, 3,640,999.
Cantella, Richard C.: *See*—
Mott, Ralph B., Sr.; Mott, Ralph B., Jr.; and Cantella, Richard C., 3,639,944.
Canty, Eugene T., to International Telephone and Telegraph Corporation. Wideband receiver. 3,641,438, Cl. 325-332.
Carling, Conrad I., to Carling Electric Inc. Toggle actuator assembly for electric switch. 3,641,291, Cl. 200-67.
Carling Electric Inc.: *See*—
Carling, Conrad I., 3,641,291.
Carlson, Alfred D.; and Kasper, Joseph G., to Tennant Company. Filter chamber. 3,639,940, Cl. 15-352.
Carlson, Donovan R.; and Maruska, William O. Honeywell Inc. Fuze apparatus. 3,640,225, Cl. 102-79.
Carmack, Carl J.: *See*—
Rubin, Fred K.; and Carmack, Carl J., 3,640,875.
Carney, Richard William James; and De Stevens, George, to Coba Corporation. Tertiary amino phenyl acetic acids. 3,641,040, Cl. 260-293.4
Carp, Ralph W.; and Miesterfeld, Frederick O., to Bendix Corporation, The. Means for delaying effective control of vehicle braking by an adaptive braking system until certain wheel velocity and deceleration conditions have been satisfied. 3,640,588, Cl. 303-21.
Carpenter, Charles W., to Hercules Incorporated. Pile fabric and method of making the same. 3,640,786, Cl. 156-73.
Carpenter, Harry M., Jr. Slip pallet lifter. 3,640,405, Cl. 214-1.
Carpenter, Paul David, Jr. Aquarium accessories with self-starting water circulating systems. 3,640,391, Cl. 210-169.
Carrier, Louis V.: *See*—
Neff, Charles G.; and Carrier, Louis V., 3,640,549.
Carroll, William J.; and Mizusawa, Frank S., to Great Lakes Chemical Corporation. Fumigant injection apparatus. 3,640,234, Cl. 111-6.
Carter, William R.; Slaybaugh, Charles Jay; and Hodgins, Patrick M., to Kelley, Edward, Corporation, mesne. Cooler chest. 3,640,420, Cl. 220-9.
Cartwright, Victor F. Delay system for regenerating pulse periodically during delay interval. 3,641,371, Cl. 307-293.
Cary, Harry W., Jr.: *See*—
Crafford, Thomas J.; Shilo, Alexander I.; and Cary, Harry W., Jr., 3,640,164.
Case, Forrest N.; Garrison, Arthur W.; Kau, Donald L.; and Smiley, David E., to United States of America, Atomic Energy Commission. Radiolytic destruction of non-biodegradable organic pesticides. 3,640,808, Cl. 204-158.
Case, J. I., Company: *See*—
Dollase, William R., 3,640,360.
Caspar Honegger: *See*—
Straus, Edgar H., 3,640,314.
Cassano, James R.; Smith, Charles E.; and Kalvitis, Robert E., to Xerox Corporation. Film support and transport apparatus. 3,640,614, Cl. 353-26.
Cassella Farbwerke Mainkur Aktiengesellschaft: *See*—
Frind, Horst; Heid, Christian; and Aman, Horst, 3,640,803.
Castrucci, Paul P.; Gates, Harlan R.; Henle, Robert A.; Pricer, Wilbur David; Morton, Robert M.; Mason, John W.; and North, William D., to International Business Machines Corporation. Write once read only store semiconductor memory. 3,641,516, Cl. 340-173.
Caterpillar Tractor Co.: *See*—
Clark, Richard B.; Morris, Hugh C.; and Whitehurst, Gerald E., 3,640,359.
Caterpillar Tractor Company: *See*—
Barnes, Randolph C., 3,640,146.
Butterfield, Max E., 3,640,035.
Cavallari, Eugenio, to Ates Componenti Elettronici S.p.A. Stabilized voltage-step-down circuit arrangement. 3,641,267, Cl. 178-7.3
Cear, Stanley, to Atlas Chemical Industries, Inc. Rigid, low-density, filled cellular polyurethanes. 3,640,920, Cl. 260-2.5
Celanese Coatings Company: *See*—
Slater, William W.; and Thow, Lawrence E., 3,640,926.
Celanese Corporation: *See*—
McAndrew, France B.; Polly, George W.; and Heinz, Walter E., 3,641,192.
Moussalli, Francis Selim, 3,640,881.
Palm, Clifford W.; and Gibson, William R., 3,640,064.
Cenco Medical/Health Supply Corporation: *See*—
Adams, Robert P., 3,639,999.
Cenker, Moses, to BASF Wyandotte Corporation. Toluene diisocyanate compositions. 3,640,886, Cl. 252-182.
Central Mine Equipment Company: *See*—
Rassieur, Charles L., 3,640,354.

Cerra, Peter A., to Dow Chemical Company, The. Process for heating polymers with dielectric heating. 3,640,913, Cl. 260-2.5
Ceskoslovenska akademie ved: *See—*
Hrdina, Jiri, 3,640,822.
Chambers, Robert R.; Isaacson, Henry V.; and Young, David W. Tin salts of partially esterified vinyl monomer- maleic anhydride copolymers. 3,640,973, Cl. 260-78.5
Champ, Robert B.; Jurgens, Henry A.; and Thompson, James O., to International Business Machines Corporation. Method for posting intelligence on dizo sensitive microfiche. 3,640,714, Cl. 96-49.
Chaplin, Richard W.; Holscher, Donald J.; Wasney, Albert Jr.; and Wheeler, Bryce A., to Hughes Aircraft Company. Night vision system. 3,641,261, Cl. 178-7.8
Chastain, James K.: *See—*
McKee, James R.; and Chastain, James K.,3,640,039.
Chatham, James R.; and Licata, William H., to United States of America, Navy. Rate stabilization system for a vehicle mounted device. 3,640,178, Cl. 89-41.
Chausse, Burnette P.: *See—*
Konrad, Charles E.; and Chausse, Burnette P.,3,641,566.
Chemagro Corporation: *See—*
Botts, Marion F.; and Regel, Erik K., 3,641,222.
Chemech Engineering Ltd.: *See—*
Westerlund, Gothe O., 3,640,804.
Chemetron Corporation: *See—*
Couch, Richard W., Jr.; and Dean, Robert C., Jr., 3,641,308.
Chemical Refiners, Inc.: *See—*
Cooper, James R., 3,640,703.
Chemische Werke Huls Aktiengesellschaft: *See—*
Michels, Aldred; and Bittscheidt, Josef, 3,640,919.
Chen, Arthur C. M., to General Electric Company. Beam addressable mass storage using thin film with bistable electrical conductivity. 3,641,510, Cl. 340-173.
Chevron Research Company: *See—*
Bakker, Nicolaas, 3,640,855.
Csicsery, Sigmund M.; Hickson, Donald A.; and Jaffe, Joseph, 3,640,904.
Jaffe, Joseph; and Kittrell, James R., 3,641,096.
Marquis, David M.; and Sweeney, William A., 3,641,131.
Olund, Sven A., 3,640,856.
Chiarolanza, Generoso; and Chiarolanza, Joseph. Selectively lockable floating snowplow mount. 3,640,005, Cl. 37-42.
Chiarolanza, Joseph: *See—*
Chiarolanza, Generoso; and Chiarolanza, Joseph,3,640,005.
Chicago Display Company: *See—*
Snyder, Alan K., 3,640,389.
Chicago Rawhide Manufacturing Co.: *See—*
Mowat, Keith B.; and Heyn, William O., 3,640,542.
Chien, Alex. Anti-flat tire device. 3,640,329, Cl. 152-205.
Chien, James C. W.; and Schwarz, Robert J., to Hercules Incorporated. Flame retardant polymers of propylene. 3,640,946, Cl. 260-41.
Chikanari, Kenichi: *See—*
Inamura, Seiichi; Kondo, Yusuke; Akita, Minoru; and Chikanari, Kenichi,3,640,509.
Childress, Scott J.; and Szabo, J Lester, to American Home Products Corporation. 2-Lower alkanoyloxy-N-sulfonylbenzamides. 3,641,114, Cl. 260-479.
Childress, Scott J.: *See—*
Sellstedt, John H.; and Childress, Scott J.,3,641,000.
Chiosi, Louis: *See—*
McNally, Francis X.; and Chiosi, Louis,3,641,353.
Chirash, William; and Burke, Richard Lerda, to Colgate-Palmolive Company. Alkaline detergent composition. 3,640,878, Cl. 252-99.
Chisholm, Daniel R.; Solomon, Jack M.; and Isbitsky, Bernard, to Witco Chemical Corporation. Liquid phase process for the production of N-alkyl morpholines. 3,641,022, Cl. 260-247.
Chow, Roberta C. L.: *See—*
Marvel, Carl S.; and Chow, Roberta C. L.,3,640,927.
Chow, Sui-Wu; and Smarook, Walter H., to Union Carbide Corporation. Ionically interacting polymers. 3,640,838, Cl. 161-190.
Christiansen, Godtfred K., to A/S Modulex. Slide-bar assembly having complementary slidable members. 3,640,017, Cl. 46-23.
Chromalloy American Corporation: *See—*
Dabrush, Charles; and Strauss, Irvin, 3,639,992.
Palmenberg, Edward C., 3,639,994.
Chu, Ge Yao, to Wang Laboratories. Wiring loom. 3,639,965, Cl. 29-203.
Ciba Corporation: *See—*
Anner, Georg; and Meystre, Charles, 3,641,069.
Anner, Georg; and Ehmann, Ludwig, 3,641,070.
Bencze, William Laszlo, 3,641,110.
Huebner, Charles Ferdinand, 3,641,179.
Ciba Limited: *See—*
Ball, Alan; Hayes, Barry James; and Matthews, Albert John, 3,641,195.
Froehlich, Alfred, 3,641,116.
Heer, Alfred; and Metzger, Karl, 3,641,064.
Hegar, Gert, 3,640,993.
Matter, Erich, 3,641,044.
Porret, Daniel; Habermeier, Juergen; and Batzer, Hans, 3,640,910.
Schmid, Rolf; Bucher, Ingrid; Fisch, Willy; and Batzer, Hans, 3,641,194.
Ciba-Geigy Corporation: *See—*
Petree, Harris E., 3,641,025.
Ciesla, Stanley F.: *See—*
Jursich, Myron J.; and Ciesla, Stanley F.,3,640,766.
Cincinnati Milacron Chemicals Inc.: *See—*
Weisfeld, Lewis B., 3,640,950.
Cini, Adrian V.: *See—*
Bauman, Joseph F.; Kurtz, Edward, Jr.; Cini, Adrian V.; and Antrobus, Robert E.,3,640,312.
Circle Engineering Co., Inc.: *See—*
Solomon, Milton, 3,640,584.
Cities Service Oil Company: *See—*
Rakow, Marvin S.; and Konig, Robert J., 3,640,692.
Citroen, Armand, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Automobile vehicle. 3,640,545, Cl. 280-124.
Citroen S.A.: *See—*
Cadiou, Jean G., 3,639,943.
Clairmonte Bros., Limited: *See—*
Clairmonte, Edward Hugh, 3,640,292.
Clairmonte, Edward Hugh, to Clairmonte Bros., Limited. Automatic pay out device. 3,640,292, Cl. 133-5.
Clark, Duncan; and Hayden, Percy, to Imperial Chemical Industries Limited. Production of ethers. 3,641,162, Cl. 260-614.
Clark, Richard B.; Morris, Hugh C.; and Whitehurst, Gerald E., to Caterpillar Tractor Co. Control system for hydrodynamic retarder. 3,640,359, Cl. 192-3.
Clarke, James F.; and Deprez, Thomas A., to Gleason Works, The. Method for grinding toothed faced members. 3,640,030, Cl. 51-325.
Clarke, Michael Raymond; and Filipowicz, Leon, to Balm Paints Limited. Cross-linkable derivatives of an addition polymer in a substantially non-polar organic liquid. 3,640,931, Cl. 260-23.
Cless, Gerhard; and De Boo, Jerome L., to Teletype Corporation. Electrodynamic transducer. 3,641,583, Cl. 346-29.
Cline, Charles D.: *See—*
Linderman, Roger C.; and Cline, Charles D.,3,640,823.
Cloud, William S., Jr. Tube-forming packaging machine. 3,640,051, Cl. 53-178.
Coackley, Robert; Reynolds, Michael Leslie; and Rodgers, Clive Douglas, to National Research Development Corporation. Infrared radiometer apparatus for detecting clear air turbulence from an aircraft. 3,641,345, Cl. 250-83.3
Coates, Clarence A., Jr.: *See—*
Weaver, Max A.; Pridgen, Herman S.; and Coates, Clarence A., Jr.,3,640,995.
Coates, William M.: *See—*
Corrigan, John R.; and Coates, William M.,3,641,058.
Coats, John H.: *See—*
Argoudelis, Alexander D.; and Coats, John H.,3,641,244.
Coba Corporation: *See—*
Carney, Richard William James; and De Stevens, George, 3,641,040.
Coba-Geigy Corporation: *See—*
Schindler, Walter; and Blattner, Hans, 3,641,056.
Cobb, Raymond L., to Phillips Petroleum Company. Production of esters by catalytic conversion of α-organooxy hydroperoxides. 3,641,075, Cl. 260-410.
Coca-Cola Company, The: *See—*
Rodth, Joseph J., 3,640,433.
Cochren, Donald R.: *See—*
Gardner, Lawrence J.; and Cochren, Donald R.,3,640,831.
Coffin, Leon B.: *See—*
Lawrence, Willis G.; and Coffin, Leon B.,3,641,229.
Cohen, Fred Michael: *See—*
Leonard, Ronald James; and Cohen, Fred Michael,3,640,340.
Cohen, Howard S.: *See—*
Armel, Jack; Kogan, Mark; and Cohen, Howard S.,3,641,342.
Cohen, Hyman L., to Eastman Kodak Company. Non-wandering hardening compounds and their use. 3,640,720, Cl. 96-111.
Cohen, Lawrence: *See—*
Hullinger, Clifford H.; Cohen, Lawrence; and Yui, Nooyuki Henry,3,640,842.
Cole, Frank J.: *See—*
Reed, William A.; and Cole, Frank J.,3,640,762.
Cole, John Charles O.: *See—*
Ilnyckyj, Stephan; Cole, John Charles O.; Feldman, Nicholas; and Strickland, Barney R.,3,640,691.
Cole, Raymond: *See—*
Wieland, Roman G.; Weber, A. John; Bearfield, Clair A.; and Cole, Raymond,3,640,520.
Colgate-Palmolive Company: *See—*
Chirash, William; and Burke, Richard Lerda, 3,640,878.
Costello, Christopher Hollet, 3,640,274.
Gray, Frederick William, 3,640,874.
Januszewski, Joseph Paul; and Bahouth, Tayseer George, 3,641,238.
Colinet, Andre; Mercier, Jacques; and Pernoud, Claude, to Regie Nationale des Usines Renault, and Automobiles Peugeot. Heating and ventilation systems of vehicles. 3,640,457, Cl. 237-12.3
Collings, Lawrence V.: *See—*
Bucaram, Salim M.; and Collings, Lawrence V.,3,640,824.
Collins, Howard W., to Integrated Building Industry, Inc. Method and apparatus for continuously making truss elements. 3,641,303, Cl. 219-56.
Collins Radio Company: *See—*
Lundgreen, Michael W.; and Denniston, Rollin H., 3,641,572.
Collins, Richard D.: *See—*
Dill, Harry L.; and Collins, Richard D.,3,640,243.

Colorado Leisure Products, Inc.: *See*—
Bargman, Dale L., Jr., 3,640,502.
Colson, James Guilbert, to Du Pont de Nemours, E. I., and Company. Polybenzimidazolecarboxamides and process. 3,640,956, Cl. 260-47.
Coman, William E., to Bendix Corporation, The. Electrical demand priority circuit. 3,641,392, Cl. 317-13.
Combustion Engineering, Inc.: *See*—
Mullen, Joseph F., 3,640,232.
Commercial Mechanisms, Inc.: *See*—
Hunsicker, Paul Robert, 3,640,262.
Commercial Solvents Corporation: *See*—
Stephan, John T.; and Golick, Alex James, 3,640,740.
Toops, Emory Earl, Jr., 3,640,697.
Commonwealth Scientific and Industrial Research Corporation: *See*—
Tauber, Elisha; and Murray, Maxwell John, 3,640,754.
Compagnie Electro-Mecanique: *See*—
LeHenaff, Jacques, 3,641,378.
Compagnie Francaine de Raffinage: *See*—
Gluntz, Claude; Meyer, Pierre; and Peyrot, Jean, 3,640,982.
Compagnie Francaise des Petroles: *See*—
Le Therisien, Louis G.; and Marion, Henri A., 3,640,079.
Serrano, Francisco M., 3,640,078.
Compagnie Generale d'Automatisme: *See*—
Noetinger, Philippe J., 3,640,367.
Compagnie Generale d'Electricite: *See*—
Tocquec, Yves, 3,641,577.
Compagnie Generale d'Electronique Industrielle Lepaute, CGEI-Lepaute: *See*—
Braillard, Pierre L.; Moreuil, Jean-Louis; and Steru, Marius, 3,640,002.
composed of Mott, Ralph Beach, Sr.: *See*—
Mott, Ralph B., Sr., Mott, Ralph B., Jr., and Cantella, Richard C., 3,639,944.
Conklin, Wayne A.: *See*—
Avery, Lowell R.; and Conklin, Wayne A., 3,640,873.
Conklin, Winfred S.: *See*—
Yates, Lester R.; Dorsey, Charles M., Jr.; Howell, John B.; Conklin, Winfred S.; Sawicki, Joseph J.; Shepherd, Reeves T., and Soares, Silvio, 3,641,434.
Conley, Walter R.; and Culp, Gordon L., to Neptune Microfloc, Incorporated. Removal of floc from settling device. 3,640,387, Cl. 210-73.
Connectronics Corporation: *See*—
Bonhomme, Francois Robert, 3,641,483.
Conrad, Lawrence H., to Minnesota Minning and Manufacturing Company. Three element microphotographic objective lens. 3,640,606, Cl. 350-226.
Conrad, Lawrence H., to Minnesota Mining and Manufacturing Company. Three element microphotographic objective lens. 3,640,607, Cl. 350-226.
Constable, Geoffrey Ernest Patrick, to Smiths Industries Limited. Access-control equipment and item-dispensing systems including such equipment. 3,641,497, Cl. 340-149.
Container Corporation of America: *See*—
Dosi, Giovanni E., 3,640,575.
Durham, Robert E., 3,640,445.
Continental Oil Company: *See*—
Groves, William L., Jr., 3,640,882.
Johnson, Morris A.; and Yang, Kang, 3,641,172.
Lundeen, Allan J.; and Yates, James F., 3,641,085.
McDonald Edward Harvey; and Banks, William P., 3,640,802.
Portwood, Owen, Jr.; Starks, Charles M.; and Washecheck, Paul H., 3,641,163.
Control Data Corporation: *See*—
La Tourrette, James T.; Newstein, Maurice C.; and Rabinowitz, Paul J., 3,641,458.
Mayer, William N., 3,641,299.
Controlled Power Corporation: *See*—
Koltuniak, Michael A.; and Urquhart, Thomas N., 3,641,419.
Conway, Daniel E.: *See*—
Conway, Edward M.; and Conway, Daniel E., 3,640,421.
Conway, Edward M.; and Conway, Daniel E., to Conway-Cleveland Corporation. Drawer construction for card files and the like. 3,640,421, Cl. 220-22.3.
Conway-Cleveland Corporation: *See*—
Conway, Edward M.; and Conway, Daniel E., 3,640,421.
Cook, Elton S.; and Berberich, Norbert J., Jr., to Stanley Drug Products, Inc. Methods of treating bacterial infections. 3,641,247, Cl. 424-211.
Cook, Robert G.: *See*—
Bagley, Donald H.; and Cook, Robert G., 3,639,959.
Cook, William C.; and Hogan, Walter J., to International Business Machines Corporation. Multiplexed video generation. 3,641,558, Cl. 340-324.
Cooper, Alfred, to Expanded Rubber & Plastics Ltd. Production of foamed polyethylene. 3,640,915, Cl. 260-2.5.
Cooper, James M.: *See*—
Laenen, Nicholas M.; and Cooper, James M., 3,640,653.
Cooper, James R., to Chemical Refiners, Inc. Cyclic integrated copper process. 3,640,703, Cl. 75-101.
Cooper, Robin D. G.: *See*—
Murphy, Charles F.; Webber, J. Alan; Kaiser, Gary V.; Van Heyningen, Earle M.; Wright, Ian G.; and Cooper, Robin D. G., 3,641,014.
Copeland, John Alexander, III, to Bell Telephone Laboratories, Incorporated. Magnetic domain logic arrangement. 3,641,518, Cl. 340-174.
Coppen, Alec James; and Metral, Jean-Pierre, to Delandale Laboratories Limited. Dosage unit sustained release oral powdered lithium salt composition for manic depressive or depressive illness prophylactic therapy. 3,641,236, Cl. 424-19.
Corbett, John Frank; and Amery, Geoffrey Wilfred, to Gillette Company, The. Process of synthesizing N-monoalkyl picramic acids. 3,641,154, Cl. 260-571.
Corlett, Ewan Christian Brew, to Hydroconic Limited. Ducted propeller systems for marine vessels. 3,640,071, Cl. 60-221.
Cornelius, George W. Evaporative loss control apparatus. 3,640,257, Cl. 123-136.
Cornelius, Kenneth R.: *See*—
Artz, Walter M.; Cornelius, Kenneth R.; Olson, John W.; Signor, Gary R.; and Slojkowski, Francis E., 3,641,505.
Cornforth, David Arthur; Waddan, Dhafir Yusuf; and Williams, Derek, to Imperial Chemical Industries Limited. Process for the catalytic dimerization of acrylonitrile. 3,641,106, Cl. 260-465.8.
Corrigan, John R.; and Coates, William M., to Mead Johnson & Company. Oxidation process employing dipyridinium dichromate. 3,641,058, Cl. 260-340.5.
Corson, Fred P.: *See*—
Pews, R. Garth; and Corson, Fred P., 3,641,004.
Cortona, Alessandro; and Calano, Giuseppe, to Olivetti, Ing. C., & C., S.p.A. Electromechanical transducer for selecting printing elements. 3,641,269, Cl. 178-27.
Cortona, Alessandro; Musso, Pietro; Saltini, Fabrizio; and Fiorenza, Giorgio, to Olivetti, Ing., C., & C., S.p.A. Machine for processing magnetic ledger cards. 3,641,317, Cl. 235-61.11.
Costello, Christopher Hollet, to Colgate-Palmolive Company. Eye-spraying device having mirror. 3,640,274, Cl. 128-173.
Costello, John P.: *See*—
Kipping, Vernon L., 3,641,334.
Costello, Raymond M.; and Beckman, Eugene B., to Foster Wheeler Corporation. Steam temperature control spray system. 3,640,250, Cl. 122-406.
Cotelle, Marie-Josephe. Decorative building element. 3,640,796, Cl. 161-43.
Cotter, William L.: *See*—
Reiss, Martin H.; and Cotter, William L., 3,641,547.
Cotton, John J.: *See*—
O'Neal, John E., 3,639,982.
Couch, Richard W., Jr.; and Dean, Robert C., Jr., to Chemetron Corporation, mesne. Plasma arc torch having liquid laminar flow jet for arc constriction. 3,641,308, Cl. 219-121.
Courtaulds Limited: *See*—
Betts, Max William; and Robinson, Frank, 3,640,096.
Betts, Max William; and Robinson, Frank, 3,640,097.
Crampsey, Edward, 3,640,942.
Higgins, Francis J., 3,641,249.
Courtenay, Jerzy Leon: *See*—
Neal, Francis John; Courtenay, Jerzy Leon; and Simmons, John Richard, 3,640,092.
Cowley, Mike L. G. Can mounted pump device. 3,640,432, Cl. 222-82.
Cox, Duncan B., Jr.; and Fertig, Kenneth, to Massachusetts Institute of Technology. Position measuring transducer comprising a stator and relatively movable flux altering member. 3,641,429, Cl. 324-34.
Coyne, Merton W.; and Palauro, Dieter K., to Gardner-Denver Company. Force pulse shaping member for percussion tool. 3,640,351, Cl. 173-105.
CPC International Inc.: *See*—
Armbruster, Frederick Carl; and Jacaway, William Arthur, Jr., 3,640,847.
Linderman, Roger C.; and Cline, Charles D., 3,640,823.
Crabb, Clarence R.; and McDonald, Leighton S., to Dow Chemical Company, The. Stabilization of chlorinated solvents. 3,641,169, Cl. 260-652.5.
Crafford, Thomas J.; Shilo, Alexander I.; and Cary, Harry W., Jr., to Crafford Tool & Die Co. Automatic chain cutting machine. 3,640,164, Cl. 83-67.
Crafford Tool & Die Co.: *See*—
Crafford, Thomas J.; Shilo, Alexander I.; and Cary, Harry W., Jr., 3,640,164.
Craig, Mordecai R.: *See*—
Altman, Murray; Craig, Mordecai R.; and Block, Irwin H., 3,640,010.
Crail, Gordon C. Luggage spotter. 3,640,008, Cl. 40-2.
Cramer, Robert B.: *See*—
Schenbelen, David F.; and Cramer, Robert B., 3,641,216.
Crampsey, Edward, to Courtaulds Limited. Manufacture of delustred nylon filaments. 3,640,942, Cl. 260-37.
Crandall, Nelson: *See*—
Blount, Charles, Jr.; and Crandall, Nelson, 3,640,102.
Crawley Machinery Co.: *See*—
Sarring, Ernest J., 3,640,372.
Creed & Company Limited: *See*—
Mason, Frederick Percival; and Waren, Frank Arthur Oakley, 3,640,247.
Cregeen, Derek, to U.S. Philips Corporation. Channel intensifier glass compositions. 3,641,382, Cl. 313-105.
Crener, Bengt Olof; Anderson, Erik Arne; and Ernolf, Stig Carl-Oskar, to Aktiebolaget Electrolux. Combination surface treating and suction cleaning apparatus. 3,639,939, Cl. 15-320.

Creskoff, Jacob J., to Vacuum Concrete Corporation of America. Flexible vacuum lifter. 3,640,562, Cl. 294-65.

Creusat-Loire: *See—*
Bouchet, Jean, 3,640,701.

Cricchi, James R.; and Lancaster, Edgar D., Jr., to Westinghouse Electric Corporation. Complementary MOSFET integrated circuit memory. 3,641,511, Cl. 340-173.

Critchley, Anthony Francis Ewart: *See—*
Whitehead, Cecil Thomas; and Critchley, Anthony Francis Ewart,3,641,502.

Crosby, John J.: *See—*
Meyfarth, Herbert J.; and Crosby, John J.,3,640,112.

Cross, Walter G.: *See—*
Lynas, Derek L.; and Cross, Walter G.,3,641,550.

Crovetti, Aldo J.: *See—*
Horrom, Bruce W.; Crovetti, Aldo J.; and Viste, Kenneth L.,3,640,699.

Crowhurst, David B.; and Thomas, John E., to Lindsay Specialty Products Limited. Directional communication signal tap. 3,641,464, Cl. 333-10.

Csaba, Gyorgy: *See—*
Korosi, Jeno; and Csaba, Gyorgy,3,641,016.

Csicsery, Sigmund M.; Hickson, Donald A.; and Jaffe, Joseph, to Chevron Research Company. Catalyst comprising layered crystalline clay-type aluminosilicate component, and method of activating said catalyst. 3,640,904, Cl. 252-455.

Cuckovic, Milenko: *See—*
Stafford, Richard W.; and Cuckovic, Milenko,3,640,142.

Culbertson, Billy M.; McKillip, William J.; and Sedor, Edward A., to Ashland Oil, Inc. Vinyl aromatic aminimides. 3,641,145, Cl. 260-558.

Culbertson, Billy M.: *See—*
McKillip, William J.; Culbertson, Billy M.; and Impola, Clarence N.,3,640,676.

Cullen, Robert E., to Eastman Kodak Company. Apparatus for sensing and counting images disposed on information bearing media having an added. 3,641,503, Cl. 340-172.5

Culp, Gordon L.: *See—*
Conley, Walter R.; and Culp, Gordon L.,3,640,387.

Cunning, Alfred C.; and Wolverton, Harry D., to General Motors Corporation. Throttle valve gauge. 3,640,128, Cl. 73-118.

Cupp, Frederick B.; and Whiting, John S., to General Dynamics Corporation. Information handling system especially for magnetic recording and reproducing of digital data. 3,641,506, Cl. 340-172.5

Cupples, Barrett L.; and Murphy, Clarence R., to Gulf Research & Development Company. Separation of alkyl bromides from the corresponding carbon number alcohol by distillation with water. 3,640,852, Cl. 203-96.

Curry, Robert W.: *See—*
Stults, Richard L.; and Curry, Robert W.,3,641,266.

Curtiss-Wright Corporation: *See—*
Leiner, Robert L.; and Avena, Salvatore, 3,640,150.

Cushman, Glenn F.; Prasad, Brijeshwari,; and Wisleder, Robert W., to Litton Systems, Inc. Correction circuit for converters. 3,641,563, Cl. 340-347.

Cutler, Joel L.; and Glickman, Joel I. Wireless alarm system. 3,641,540, Cl. 340-224.

Cutler, Joel L.; and Glickman, Joel L., to Transalarm Electronics, Inc. Alarm system. 3,641,425, Cl. 340-224.

Cutler-Hammer, Inc.: *See—*
Elliot, William H.; and Small, Isadore, III, 3,641,397.

Dabritz, Erich; Schafer, Werner; Grewe, Ferdinand; and Scheinpflug, Hans, to Farbenfabriken Bayer Aktiengesellschaft. N-(1,3-thiazol-2-yl)-dithiocarbamic acid derivatives. 3,641,043, Cl. 260-306.8

Dabrush, Charles; and Strauss, Irvin, to Chromalloy American Corporation. Chord length gauge. 3,639,992, Cl. 33-174.

Dahlin, Erik B., to Measurex Corporation. Method for measuring the amount of substance associated with a base material. 3,641,349, Cl. 250-83.3

Dake, James O., Jr.: *See—*
Kaufman, Martin H.; O'Drobinak, John D.; and Dake, James O., Jr.,3,640,070.

Dallmann, Bruno: *See—*
Brotz, Walter; and Dallmann, Bruno,3,640,828.

Dalzell, Darwin Allen, to Michigan Chemical Corporation. Production of flame retardant polypropylene compositions. 3,640,949, Cl. 260-45.75

Damon Corporation: *See—*
Ferrari, Andres, 3,640,388.
Hurtig, Carl R.; Ferrari, Andres; and Khoury, Amin J., 3,640,267.
Hurtig, Carl R., 3,640,393.

Dancy, Robert C., Jr., to Allis-Chalmers Manufacturing Company. Apparatus for making intravenous or intra-arterial injections. 3,640,276, Cl. 128-214.

Darbonville, Pierre Justin Auguste. Plant for closure of foundry moulds. 3,640,335, Cl. 164-339.

Darley, Henry C. H., to Shell Oil Company. Stabilization of hard shaly formations with alkali metal silicate. 3,640,343, Cl. 166-292.

Darling, Thomas W., to Turner Brothers Asbestos Company Limited. Chrysotile asbestos fiber reinforced polymers of propylene. 3,640,929, Cl. 260-23.

Darr, Donald E.; Edwards, G Byron; Loehr, Clifford E.; and Young, Elgin E., to PPG Industries, Inc. Method of preparing pigmentary titanium dioxide. 3,640,745, Cl. 106-300.

Dart, Edward Charles: *See—*
Foster, Richard Gregory; Joy, David Richard; Hepworth, Paul; and Dart, Edward Charles,3,641,173.

Data Display Systems, Inc.: *See—*
Di Vita, Philip S.; Powers, Earl N.; and Werneth, Charles J., 3,641,509.

Dathe, Christian: *See—*
Muller, Richard; Frey, Hans; and Dathe, Christian,3,641,082.

Davenport, William G.: *See—*
Reiner, Joel Russell; Preusch, William J.; and Davenport, William G.,3,640,233.

Davis, Bernard J., to Reichhold Chemicals, Inc. Vinyl toluene-alpha methyl styrene copolymers and method of preparing the same. 3,640,981, Cl. 260-88.2

Davis, Gary F., Jr. Black and white television camera expandable to a color television camera. 3,641,256, Cl. 178-5.4

Davis, Hugh J. Method and device for biopsy specimen collecting and handling. 3,640,268, Cl. 128-2.

Davis, Jerry L.: *See—*
Harlan, Martin L.; Davis, Jerry L.; and Nyland, Lloyd A.,3,640,325.

Davis, Martin A.; and Dobson, Thomas A., to Ayerst, McKenna and Harrison, Limited. 10,11-Dihydro-10,5-(iminomethano)-5H-dibenzo a,d cyclohepten-10-01; acid addition salts thereof; and process for preparing same. 3,641,038, Cl. 260-289.

Davis, Tyler B., to Bancroft Racket Company. Reinforcing facing for a strung racket. 3,640,533, Cl. 273-73.

Davis, William W.; and Ose, Earl E., to Lilly, Eli, and Company. Tylosin-polyoxyethylene compositions for controlling mycoplasma infections. 3,641,241, Cl. 424-120.

D.E.A. Digital Electronic Automation Societa per Azioni: *See—*
Sartorio, Franco, 3,639,993.

Dean, Robert C., Jr.: *See—*
Couch, Richard W., Jr.; and Dean, Robert C., Jr.,3,641,308.

De Boo, Jerome L.: *See—*
Cless, Gerhard; and De Boo, Jerome L.,3,641,583.

DeCasperis, Anthony J., to Pfizer Inc. Process for stabilizing fowl red blood cells. 3,640,896, Cl. 252-408.

Deeds, Douglas. Composite structural core assembly. 3,640,798, Cl. 161-68.

Deering Milliken Research Corporation: *See—*
Tindale, Alfonso, 3,640,315.

Dehne, Axel G., to Hughes Aircraft Company. Cryogenic refrigerator cycle. 3,640,082, Cl. 62-6.

Deinet, Adolph J.; and Klein, David X., to Tenneco Chemicals, Inc. Process for the production of aromatic hydroxyaldehydes. 3,641,158, Cl. 260-600.

Delalande S.A.: *See—*
Fauran, Claude P.; Raynaud, Guy M.; Oliver, Rene A.; and Douzon, Colette A., 3,641,036.
Pourrias, Bernard; Huet, Yves; and Pomaret, Carlos, 3,641,124.

Delandale Laboratories Limited: *See—*
Coppen, Alec James; and Metral, Jean-Pierre, 3,641,236.

De Langis, Philip A. Apparatus for electrotherapy of the pubococcygeus. 3,640,284, Cl. 128-422.

Delano, Roger A.: *See—*
Schofield, John Allan; and Delano, Roger A.,3,640,884.

Delgado, Jose M. R. Fluid-conducting instrument insertable in living organisms. 3,640,269, Cl. 128-2.

Del Rosso, Victor, to Hi-Speed Checkweigher Co., Inc. Apparatus for weight classifying odd shaped articles. 3,640,384, Cl. 209-74.

Deltrol Corporation: *See—*
Harris, John L., 3,640,085.

De Ment, Jack. Optical modulation by fluidic optics utilizing chromatic aberration. 3,641,354, Cl. 250-216.

De Mets, Albert. Press, particularly for forming fibre plates. 3,640,660, Cl. 18-16.

Demler, Henry William, Sr., to AMP Incorporated. Fluid coupling with connection and sealing feature. 3,640,309, Cl. 137-614.04

Demler, Henry William, Sr.; and Weist, Edward Landis, said Demler assor. to AMP Incorporated. Vacuum or pressure coupling devices. 3,640,552, Cl. 285-110.

Deninger, Wolfgang: *See—*
Eimers, Erich; Deninger, Wolfgang; and Alt, Bernhard,3,641,203.

Denki Onkyo Co. Ltd.: *See—*
Katayama, Shitomi; and Horikawa, Hideichi, 3,640,971.

Denley, Ronald S., to Teletype Corporation. Function performing mechanism. 3,640,370, Cl. 197-114.

Denniston, Rollin H.: *See—*
Lundgreen, Michael W.; and Denniston, Rollin H.,3,641,572.

Deprez, Thomas A.: *See—*
Clarke, James F.; and Deprez, Thomas A.,3,640,030.

deRooij, Abraham H., to Stamicarbon N.V. Cyclic process for the preparation of an oxime from a hydroxyl-ammonium salt solution. 3,641,150, Cl. 260-566.

Derouin, Gerald J.: *See—*
Girard, Christian F.; and Derouin, Gerald J.,3,640,125.

De Ruggieri: *See—*
Nathansohn, Giangiacomo; Odasso, Gianfranco; De Ruggieri, and Guzzi, Umberto,3,641,007.

De Sandre, Giovanni; and Garziera, Gastone, to Olivetti, Ing., C., & C., S.p.A. Electronic computer keyboard control. 3,641,329, Cl. 235-156.

Descant, Mark. Louver door sander. 3,640,031, Cl. 51-391.

De Stevens, George: *See*—
Carney, Richard William James; and De Stevens, George,3,641,040.
Dethloff, Jurgen; and Grottrup, Helmut. Identification system. 3,641,316, Cl. 235-61.7
Detweiler, John R., Jr.; and Tummala, Rao R., to International Business Machines Corporation. Borosilicate glass composition. 3,640,738, Cl. 106-54.
Deutsch Fastener Corporation: *See*—
Burt, John, 3,640,327.
Gulistan, Bulent, 3,639,971.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Goldmann, Gerhard, 3,640,696.
Deutsche Gold-und Silber-Scheideanstalt vormals Roessler: *See*—
Lea, Hans, 3,640,510.
de Varda, Giorgio: *See*—
Perna, Aldo; and de Varda, Giorgio,3,641,275.
Dever, James L.; and Hodan, James J., to Hooker Chemical Corporation. Process for preparing cyclic phosphorohalidites. 3,641,225, Cl. 260-976.
Diesel Kiki Kabushiki Kaisha: *See*—
Isobe, Hiroshi; Aoki, Hachiro; and Tanaka, Noritoshi, 3,640,258.
Dietz, Albert; Goodspeed, Neil C.; and May, Russell R., Jr., to PPG Industries, Inc. Titanium dioxide of improved chalk resistance. 3,640,744, Cl. 106-300.
Dietz, Johannes. Refuse disposal arrangement. 3,640,495, Cl. 248-101.
Dill, Douglas W., to Johnson, S. C., & Son, Inc. Foam producing compositions. 3,640,916, Cl. 260-2.5
Dill, Harry L.; and Collins, Richard D., to Maryland Cup Corporation. Machine for manufacturing a novelty ice cream product. 3,640,243, Cl. 118-24.
Dilot, Rolf Nagnus, to AB Akerlund & Rausing. Method of making a package, comprising an outer carton blank with aligning and provided with means preventing wedging. 3,640,188, Cl. 93-36.01
Dils, Curtis C., Jr. Method and apparatus for making and placing light weight. 3,640,511, Cl. 259-148.
Di Luca, Henry: *See*—
Fulton, Thomas Philip; and Di Luca, Henry,3,640,767.
Dimitroff, Dimiter V., to Bristol-Myers Company. Split die for extruding laminated tubing. 3,640,659, Cl. 425-133.
Dinges, Karl: *See*—
Ott, Karl-Heinz; Schuster, Herbert; Meckel, Walter; Dinges, Karl; and Muller, Erwin,3,641,209.
Weitzel, Hans; Dinges, Karl; Gobel, Wilhelm; and Hardt, Dietrich,3,641,206.
Dirke Computer Systems Corporation: *See*—
Dirks, Gerhard, 3,641,528.
Dirks, Gerhard, to Dirke Computer Systems Corporation, mesne. Signal storing device with removable signal storing unit. 3,641,528, Cl. 340-174.1
Di Stefano, Ralph David; and James, Edward Anthony, to RCA Corporation. Selective deposition of metal. 3,640,765, Cl. 117-212.
Distler, Harry; and Widder, Rudi, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of sulfitobetaines. 3,641,072, Cl. 260-401.
Dittmar, Bruce I., to Du Pont de Nemours, E. I., and Company. Alkyl 1-(substituted alkylideneaminooxycarbonyl)-2- benzimidazolecarbamates. 3,641,048, Cl. 260-309.2
Di Vita, Philip S.; Powers, Earl N.; and Werneth, Charles J., to Data Display Systems, Inc. Digital data analysis and display device. 3,641,509, Cl. 340-173.
Dixie Size and Chemical Co.: *See*—
Buckley, Herman T., 3,641,073.
Dixon, Christopher George Piers: *See*—
Jenkins, Derek Keith; and Dixon, Christopher George Piers,3,641,176.
Dixon, Rod P., to United States of America, Atomic Energy Commission. Recovery of geothermal energy by means of under- ground nuclear detonations. 3,640,336, Cl. 165-1.
Dobson, Thomas A.: *See*—
Davis, Martin A.; and Dobson, Thomas A.,3,641,038.
Doehler, Emil J. Vehicle safety guard. 3,640,572, Cl. 297-390.
Dokopoulos, Petros, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. High-current high-voltage switch with incisor electrode. 3,641,289, Cl. 200-61.08
Dollase, William R., to Case, J. I., Company. Differential lock with pressure modulating exhaust valve. 3,640,360, Cl. 192-4.
Dombro, Robert A.: *See*—
Schmerling, Louis; and Dombro, Robert A.,3,641,165.
Donaghu, Fay J., to Kerr McGee Chemical Corporation. Peroxygen composition containing an alkali metal silicate and an organic acid anhydride. 3,640,876, Cl. 252-99.
Dorplastex A.G.: *See*—
Hanslik, Wilhelm, 3,640,669.
Dorsey, Charles M., Jr.: *See*—
Yates, Lester R.; Dorsey, Charles M., Jr.; Howell, John B.; Conklin, Winfred S.; Sawicki, Joseph J.; Shepherd, Reeves T.; and Soares, Silvio,3,641,434.
Dosi, Giovanni E., to Container Corporation of America. Article of furniture formed from paperboard. 3,640,575, Cl. 297-440.
Dostantni, Albert: *See*—
Pacault, Pierre H.; and Dostantni, Albert,3,640,339.
Douglas, Lawrence M.; and Erlichman, Irving, to Polaroid Corporation. Film advancing apparatus. 3,640,200, Cl. 95-19.
Douglas, Robert A. Apparatus for and method of manufacturing diffraction gratings. 3,639,991, Cl. 33-19.
Douglas, Robert D. Radar range mark calibrator. 3,641,574, Cl. 343-17.7
Douzon, Colette A.: *See*—
Fauran, Claude P.; Raynaud, Guy M.; Oliver, Rene A.; and Douzon, Colette A.,3,641,036.
Dover Molded Products Company: *See*—
Williams, Robert J., 3,640,418.
Dow Chemical Company: *See*—
Avery, Lowell R.; and Conklin, Wayne A., 3,640,873.
Dow Chemical Company, The: *See*—
Anderson, Richard W.; and Frick, Hughie R., 3,641,020.
Bublitz, Donald E., 3,641,037.
Cerra, Peter A., 3,640,913.
Crabb, Clarence R.; and McDonald, Leighton S., 3,641,169.
Hall, Richard H.; Roberts, Carleton W.; Sikkema, Andrew J.; and Lawson, Junior J., 3,641,208.
Jones, Giffin D.; and Roth, Harold H., 3,640,909.
Levine, Leonard, 3,641,033.
Narayana, Munisamappa; Keskkula, Henno; and Mason, Jerry E., 3,641,212.
Pews, R Garth; and Corson, Fred P., 3,641,004.
Pews, Richard Garth; Hand, Clare R.; and Roberts, Carleton W., 3,641,160.
Schenbelen, David F.; and Cramer, Robert B., 3,641,216.
Schneider, John A.; and Moran, John B., 3,640,857.
Sheetz, David P., 3,640,922.
Stowe, Robert A.; and Martin, Irvin J., 3,641,180.
Strange, Carl P.; and Liu, Gordon Y. T., 3,641,211.
Tomalia, Donald A.; and Thomas, Robert J., 3,640,957.
Trepanier, Donald L.; and Krieger, Paul E., 3,641,019.
Dow Corning Corporation: *See*—
Mohrlok, Sharon R., 3,641,239.
Draber, Wilfried: *See*—
Buchel, Karl-Heinz; Draber, Wilfried; Hammann, Ingeborg; and Unterstenhofer, Gunter,3,641,098.
Dracon Industries: *See*—
Drake, King B., 3,641,476.
Draiswerke G.m.b.H.: *See*—
Engels, Kaspar, 3,640,476.
Drake, King B., to Dracon Industries. Telephone terminal clip-on protector. 3,641,476, Cl. 339-36.
Dreier, Donald E.: *See*—
Miles, Edwin R.; and Dreier, Donald E.,3,640,132.
Drejza, John E., to International Business Machines Corporation. Print hammer control means for pivotally mounted type members. 3,640,217, Cl. 101-93.
Droste, Wilhelm: *See*—
Scharf, Hans-Dieter; Droste, Wilhelm; and Liebig, Rita,3,641,057.
Drummond, Linwood E.: *See*—
Roudabush, Robert L.; and Drummond, Linwood E.,3,641,108.
Drzala, Raymond J., to Allied Thermal Corporation. Apparatus for balancing fluid distribution dystems. 3,640,307, Cl. 137-557.
Dubois, Robert: *See*—
Westerkamp, Hugo; and Dubois, Robert,3,641,284.
Ducote, Nolan J. Retractable mud flaps for dump trucks and trailers. 3,640,577, Cl. 298-1.
Duffy, Joseph J.; and Sims, Stuart Donald, to Hadron, Inc. Thermometer trimming method and apparatus. 3,641,307, Cl. 219-121.
Duncan, Carolyn L.: *See*—
Duncan, William D.; and Duncan, Carolyn L.,3,639,945.
Duncan, Leslie C. V., to Southbourne Rubber Company Limited. Plug or stopper for the open ends of tubular metal appliances. 3,640,496, Cl. 248-188.9
Duncan, Richard D.; and Salzano, George H., to United States of America, Atomic Energy Commission. Tube spacer tool. 3,640,115, Cl. 72-393.
Duncan, William D.; and Duncan, Carolyn L. Poultry cutter. 3,639,945, Cl. 17-11.
Dunlop Company Limited, The: *See*—
Mitchell, William Eric, 3,639,964.
Dunlop Holdings Limited: *See*—
Jenkins, Peter J.; and Neller, William C., 3,640,371.
Du Pont de Nemours, E. I., and Company: *See*—
Agolini, Franco, 3,641,217.
Anderson, Daniel Gustav; Gladding, Edward Karcher; and Sullivan, Raymond, 3,641,104.
Barth, Walter J., 3,640,755.
Boswell, George Albert, Jr.; and Ripka, William Charles, 3,641,005.
Breda, Ernest J., 3,641,107.
Bydal, Bruce Alfred, 3,640,308.
Colson, James Guilbert, 3,640,956.
Dittmar, Bruce I., 3,641,048.
England, David C., 3,641,142.
Hartley, Irby Ennis, Jr., 3,640,058.
Mc Clellan, William; and Stiles, Alvin B., 3,640,900.
Ripka, William Charles, 3,641,006.
Su, Aaron Chung Liong, 3,640,898.
Dura Fiber, Inc.: *See*—
Jenks, Herbert R., 3,641,230.
Durand, Marce, to Pomagalski, Jean, S. A. Power hoisting apparatus. 3,640,506, Cl. 254-187.

Durand, Marcel, to Pomagalski, Jean, S.A. Winch or hoist with a friction brake device. 3,640,505, Cl. 254-150.

Durham, Robert E., to Container Corporation of America. Partition divider. 3,640,445, Cl. 229-15.

Durkoppwerke GmbH: *See*—
Nicolay, Karl, 3,640,236.

Duschinsky, Robert: *See*—
Beaman, Alden Gamaliel; Duschinsky, Robert; and Tautz, William Paul,3,641,047.

Duve, Gunther: *See*—
Oberst, Hermann; Leonhard, Hofheim; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,835.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,830.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,833.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,834.
Oberst, Hermann; Reihs, Leonhard Hofheim; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,836.

Dynamics Research Corporation: *See*—
Ivers, Richard J.; and McDonough, William H., 3,641,565.

Dynamit Nobel AG: *See*—
Fuchs, Otto, 3,640,918.
Termin, Eric; and Ismail, Roshdy, 3,641,079.

Dynamit Nobel Aktiengesellschaft: *See*—
Blumenfeld, Georg, 3,641,059.
Buning, Robert; Raalf, Hans; and Pungs, Wolfgang, 3,640,930.

Eastall, Martin Harold, to British Domestics Appliances Limited. Clothes washing and spin drying machines. 3,640,098, Cl. 68-12.

Eastman Kodak Company: *See*—
Arcesi, Joseph A.; and Rauner, Frederick J., 3,640,722.
Bowers, Daniel G., 3,641,297.
Brooks, David N., 3,640,196.
Cohen, Hyman L., 3,640,720.
Cullen, Robert E., 3,641,503.
Gates, John W., Jr.; Wise, Albert W.; Beavers, Dorothy J.; and Miller, Paul E., 3,641,046.
Gordon, Robert A., 3,640,204.
Humphriss, Wesley D.; and Bartlett, Lawrence C., 3,640,708.
James, Claire L., 3,640,198.
Martin, William A.; and Bielicki, Marvin S., 3,641,282.
Morse, John E.; and Rosenburgh, Norman J., 3,640,438.
Roudabush, Robert L.; and Drummond, Linwood E., 3,641,108.
Selke, Lynn A., 3,640,439.
Touey, George P.; and Sloan, Cephas H., 3,640,742.
Weaver, Max A.; Pridgen, Herman S.; and Coates, Clarence A., Jr., 3,640,995.
Wolfe, Robert N., 3,640,602.

Eaton, Bruce, to United States of America, Air Force, mesne. Pyro mechanical release device. 3,640,174, Cl. 85-9.

Eaton Yale & Towne Inc.: *See*—
Brawn, Darrell S., 3,640,546.
Freismuth, John S.; and Beneditti, Nello L., 3,640,454.
Moyer, William H., 3,641,375.
Nemiroff, Robert V., 3,641,411.
Ohntrup, Frederick F.; Truemper, John P.; and Smith, Billy C., 3,641,413.
Wahl, James A.; and Nieminski, Robert A., 3,640,415.

Eberle, Hans; and Wuttke, Gerhard, to Grunzweig & Hartmann Aktiengesellschaft. Filamentary polyolefin foam product and process of making the same. 3,640,921, Cl. 260-2.5.

Eberly, Paul E., Jr.; and Kimberlin, Charles N., Jr., to Esso Research and Engineering Company. Alkylation of aromatic hydrocarbons. 3,641,177, Cl. 260-671.

Ebert, Michael,: *See*—
Reick, Franklin G.; and Wilder, Joseph R., 3,641,332.

Ebigt, Joachim: *See*—
Oberst, Hermann; Leonhard, Hofheim; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,835.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,830.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,833.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,834.
Oberst, Hermann; Reihs, Leonhard Hofheim; Ebigt, Joachim, Duve, Gunther; and Schommer, Alfred,3,640,836.

Eckholt, Heinrich, to Hamel G.m.b.H., Zwirnmaschinen. Spindle coupling. 3,640,144, Cl. 74-242.15.

Eckrich, Peter, & Sons, Inc.: *See*—
Whitney, John A.; and Woods, Richard E., 3,641,538.

Edgerton, William H., to Smith Kline & French Laboratories. Poly (aminomethyl) cyclopentanes. 3,641,149, Cl. 260-563.

Educational Research Council of America: *See*—
Zimmerman, Burton R.; Bodley, Roger W.; and Goodman, Robert C., 3,640,195.

Edwards, G Byron: *See*—
Darr, Donald E.; Edwards, G Byron; Loehr, Clifford E.; and Young, Elgin E.,3,640,745.

Egbom, Clarence W.: *See*—
Smith, Randal E.; and Egbom, Clarence W.,3,640,385.

Eggert, Walter S., Jr., to Boothe Airside Services, Inc., mesne. Canopy apparatus. 3,639,934, Cl. 14-71.

Egnaczak, Raymond K.; and Squassoni, Gino F., to Xerox Corporation. Opaque illumination and scanning system. 3,640,616, Cl. 355-8.

Egyesult Gyogyszer es Tapszergyar: *See*—
Korosi, Jeno; and Csaba, Gyorgy, 3,641,016.
Rakoczi, Jozsef; Mikite, Gyula; Petocz, Lujza; Fischer, Janos; Grasser, Katalin; and Kosoczky, Ibolya, 3,641,039.

Ehmann, Ludwig: *See*—
Anner, Georg; and Ehmann, Ludwig,3,641,070.

Eickemeyer, Rudolf. Process for hydrolytic degradation of cellulosic materials to sugars. 3,640,768, Cl. 127-37.

Eide, Melvin O.: *See*—
Thompson, Burton J.; and Eide, Melvin O.,3,641,414.

Eimers, Erich; Deninger, Wolfgang; and Alt, Bernhard, to Farbenfabriken Bayer Aktiengesellschaft. Polyester mixtures suitable as foundation materials. 3,641,203, Cl. 260-870.

Eisenberg, Ben: *See*—
Shatz, Abram; and Eisenberg, Ben,3,640,620.

Eisentraut, Arne L.: *See*—
Schelin, Carl O.; and Eisentraut, Arne L.,3,639,972.

Eklund, Phillip R., to United States of America, Air Force. Rolling contact bearing having temperature compensation. 3,640,591, Cl. 308-184.

Ekstrom, Ake, to Allmanna Svenska Elektriska Aktiebolaget. Static converter station for high voltage. 3,641,356, Cl. 307-64.

Electone, Inc.: *See*—
Lamp, Paul F., 3,641,288.

Electric Fuel Propulsion, Incorporated: *See*—
Rippel, Wally E., 3,641,364.

Electricite de France (Service National): *See*—
Frerson, Raymond; Gravier, Claude; Ravenel, Pierre; and Soupene, Pierre, 3,640,621.

Electronique Marcel Dassault: *See*—
Fournillon, Germain, 3,641,252.

Elitex, Zavody textilniho strojirenstvi: *See*—
Sedlarik, Jargslav; Havlas, Jiri; and Kostelecky, Premysl, 3,640,440.

Elitex-Zavody lextilniho strojirenstvi generalni: *See*—
Lutovsky, Josef; and Prasil, Vladimir, 3,640,059.

Elkuch, Franz, to Etablissement Procor. Electrostatic system for generating periodical mechanical vibrations. 3,641,373, Cl. 310-6.

Elkuch, Ludwig, to Liongas Aktiengesellschaft. Container filling means. 3,640,320, Cl. 141-59.

Elliot, William H.; and Small, Isadore, III, to Cutler-Hammer, Inc. Off-delay solid state timer systems. 3,641,397, Cl. 317-141.

Elliott, Melvin R., 1/2 to Hanscom, Genevieve I., Magnuson, Robert, and Thomson, Lois J. Shuffle feed motion transmitting connection. 3,640,378, Cl. 198-218.

Ellis, Bernard; Petrow, Vaklimir; and Stanway, David Neil. Process for the preparation of pregn-5-ene-4, 20- diones and intermediates in the production thereof. 3,641,008, Cl. 260-239.55.

Ellison, John M. Tobacco smoking pipe conditioning apparatus. 3,640,001, Cl. 34-218.

Ellison, Peter James: *See*—
Selman, Gordon Leslie; and Ellison, Peter James,3,640,705.

Ellman, Harold R. Method of making machine sewn jacket and jacket construction. 3,639,914, Cl. 2-93.

Elton, Robert L., to Minnesota Mining and Manufacturing Company. Microporous products. 3,640,829, Cl. 161-159.

Emerson, Carl D.; and Aichenegg, Paul C. Alkyl and aryl esters of polyhalodithio alcohols. 3,641,109, Cl. 260-473.

Emoto, Masayuki: *See*—
Iimura, Tsutomu; Kurokawa, Susumu; and Emoto, Masayuki,3,640,867.

Ence, Elmars, to Olin Corporation. High conductivity copper alloys. 3,640,779, Cl. 148-32.5.

Engeler, William E.: *See*—
Brown, Dale M.; and Engeler, William E.,3,641,405.

Engelfried, Otto; Neumann, Friedmund; and Wiechert, Rudolf, to Schering Aktiengesellschaft. 17β-Hydroxy-18-methyl-4-estrene-3-one and derivatives thereof. 3,641,013, Cl. 424-243.

Engelhardt, Bjorn H., to Raytheon Company. Variable impedance semiconductor network. 3,641,449, Cl. 330-29.

Engels, Kaspar, to Drahtwerke G.m.b.H. Stirring mill. 3,640,476, Cl. 241-74.

England, David C., to Du Pont de Nemours, E. I., and Company. Pyrogenic synthesis of perfluoroacrylyl fluoride. 3,641,142, Cl. 260-544.

English Numbering Machines Limited: *See*—
Brooke, Edric Raymond, 3,641,283.

Enivar Enterprises, Inc.: *See*—
Florsheim, Leonard S., Jr.; Lieberman, David A.; Archer, Harold B.; and Nothmann, Gerhard A., 3,640,623.

Enjoji, Teruyuki: *See*—
Ogawa, Masao; Enjoji, Teruyuki; and Arai, Humio,3,640,914.

Ennis, Robert M., Jr.: *See*—
Jamba, Douglas M.; and Ennis, Robert M., Jr.,3,641,341.

Environment/One Corporation: *See*—
Walther, Eric G., 3,640,688.

Eprad Incorporated: *See*—
Boudouris, Angelo; Kulish, Stanley J., Jr.; and Plumadore, Harold M., 3,640,611.

Epstein, Peter F., to Stauffer Chemical Company. Synergistic insecticidal mixture containing benzothiazolines and insecticidal use of the mixture. 3,641,245, Cl. 424-188.

Erhard, Albert E.; and Allison, Jack B., to Molybdenum Corporation of America. Process for recovery of columbium. 3,640,679, Cl. 23-15.
Erie Tool Works: *See*—
Muse, George H.; and Keane, Peter J., 3,639,980.
Erlich, Giora, to Hayward Manufacturing Company, Inc. Multiport valve. 3,640,310, Cl. 137-625.46
Erlichman, Irving: *See*—
Douglas, Lawrence M.; and Erlichman, Irving, 3,640,200.
Erlichman, Irving, to Polaroid Corporation. Camera frame member. 3,640,724, Cl. 95-11.
Ernest, Dale S., to Broughtonq Jesse I., and Hannon, John G. Air humidifying system and compact spray humidifier for the same. 3,640,266, Cl. 126-113.
Ernolf, Stig Carl-Oskar: *See*—
Crener, Bengt Olof; Anderson, Erik Arne; and Ernolf, Stig Carl-Oskar, 3,639,939.
Ernst, Max. Electromagnetic control, especially for crossing gates of toy and model railroads. 3,641,466, Cl. 335-190.
Esche, Charles D.: *See*—
Harrison, Bobby G.; and Esche, Charles D., 3,640,087.
Escott, George K.: *See*—
Anderson, Yngve R.; and Escott, George K., 3,640,046.
Esso Research and Engineering Company: *See*—
Cahn, Robert P.; and Angier, Derek J., 3,641,183.
Eberly, Paul E., Jr.; and Kimberlin, Charles N., Jr., 3,641,177.
Foroulis, Zisis Andrew, 3,640,895.
Hamner, Glen P., 3,640,818.
Ilnyckyj, Stephan; Cole, John Charles O.; Feldman, Nicholas; and Strickland, Barney R., 3,640,691.
Kivlen, John A.; Struth, Bert W.; and Weiss, Clifford P., 3,641,190.
Kramer, George M., 3,641,185.
Robbins, Max L.; and Brownawell, Darrell W., 3,641,181.
Shakesby, Leonard, 3,640,551.
Etablissement Procor: *See*—
Elkuch, Franz, 3,641,373.
Etes, Donald E., to Hollister Incorporated. Composition containing gel. 3,640,741, Cl. 106-170.
Ethyl Corporation: *See*—
Shepherd, Lawrence H., Jr., 3,641,084.
Shepherd, Lawrence H., Jr., 3,641,186.
Etoh, Kuniomi: *See*—
Hamanaka, Yasushi; Tajiri, Hiromi; Etoh, Kuniomi; Furukawa, Kaoru; and Masai, Yukito, 3,640,761.
Excelermatic, Inc.: *See*—
Kraus, Charles E., 3,640,145.
Expanded Rubber & Plastics Ltd.: *See*—
Cooper, Alfred, 3,640,915.
Eyssen, Henrik, to Recherche et Industrie Therapeutiques R.I.T. Microbial reduction of Δ^5 steroids. 3,640,848, Cl. 195-51.
Ezaki, Joichiro, to TDK Electronics Company Ltd. Magnetic-core memory matrix. 3,641,521, Cl. 340-174.
Fabric Tire Hose Company: *See*—
Boguslawski, Jan J., 3,640,656.
Fairchild Camera and Instrument Corporation: *See*—
Frohman-Bentchkowsky, Dov, 3,641,512.
Faith, William T., Jr.: *See*—
Sherba, Samuel E.; Steigerwalt, Ronald B.; Faith, William T., Jr.; and Smythe, Carl V., 3,640,725.
Falk, Sven Uno; and Alfelt, Lars-Goran, to Svenska Ackumulator Aktiebolaget Jungner. Method of producing an electrode for alkaline batteries. 3,640,772, Cl. 136-67.
Fanella, Robert J.: *See*—
Beck, Fred R.; Fanella, Robert J.; and Gioia, Norman F., 3,640,483.
Fansteel Inc.: *See*—
Glaski, Frederick A.; Holzl, Robert A.; and Kaplan, Richard B., 3,640,689.
Fantoni, Giuseppe, to Olivetti, Ing. C., & C., S.p.A. Tool holder assembly for machine tool. 3,640,147, Cl. 74-424.8.
Farbanish, Walter, to Zenith Radio Corporation. Printed circuit inductive loop antenna. 3,641,576, Cl. 343-743.
Farbenfabriken Bayer Aktiengesellschaft: *See*—
Arlt, Dieter; and Handschuh, Volkmar, 3,641,094.
Balle, Gerhard; and Kolb, Gunter, 3,641,119.
Bode, Klaus-Dieter; and Schellhammer, Carl-Wolfgang, 3,641,023.
Buchel, Karl-Heinz; Draber, Wilfried; Hammann, Ingeborg; and Unterstenhofer, Gunter, 3,641,098.
Dabritz, Erich; Schafer, Werner; Grewe, Ferdinand; and Scheinpflug, Hans, 3,641,043.
Eimers, Erich; Deninger, Wolfgang; and Alt, Bernhard, 3,641,203.
Harnisch, Horst, 3,640,994.
Hennig, Hans Joachim; and Fischer, Peter, 3,640,966.
Hoffmann, Hellmut; and Scheinpflug, Hans, 3,641,224.
Keberle, Wolfgang, 3,641,140.
Konig, Klaus; Muller, Erwin; Kallert, Wilhelm; and Muhlhausen, Cornelius, 3,640,967.
Krimm, Heinrich; Schnell, Hermann; and Lenz, Gunther, 3,640,955.
Ott, Karl-Heinz; Schuster, Herbert; Meckel, Walter; Dinges, Karl; and Muller, Erwin, 3,641,209.
Schlor, Hanshelmut, 3,641,141.
Schlor, Hanshelmut; Hammann, Ingeborg; and Homeyer, Bernhard, 3,641,223.
Schrader, Gerhard; Hammann, Ingeborg; and Stendel, Wilhelm, 3,641,221.
Thoma, Wilhelm; Oertel, Harald; Rinke, Heinrich; and Bahr, Ulrich, 3,640,937.
Walz, Klaus; Hees, Walter; and Quaedvlieg, Mathieu, 3,640,677.
Weitzel, Hans; Dinges, Karl; Gobel, Wilhelm; and Hardt, Dietrich, 3,641,206.
Ziemann, Heinz; Lehmann, Wolfgang; and Troemel, Gerhard, 3,640,840.
Farber, Sheldon: *See*—
Shavel, John, Jr.; and Farber, Sheldon, 3,641,152.
Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See*—
Brotz, Walter; and Dallmann, Bruno, 3,640,828.
Fernholz, Hans; and Jacobsen, Gunter, 3,641,113.
Frischkorn, Hans; Pintschovius, Ulrich; Schinzel, Erich; and Smerz, Otto, 3,641,051.
Grafmuller, Fritz, 3,640,021.
Moschel, Albrecht, 3,640,962.
Nolken, Ernst, 3,640,917.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, 3,640,830.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, 3,640,833.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, 3,640,834.
Oberst, Hermann; Leonhard, Hofheim; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, 3,640,835.
Oberst, Hermann; Reihs, Leonhard Hofheim; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, 3,640,836.
Radscheit, Kurt; Stache, Ulrich; Haede, Werner; Fritsch, Werner; and Lindner, Ernst, 3,641,009.
Farge, Daniel; Messer, Mayer Naoum; and Moutonnier, Claude, to Rhone-Poulenc S.A. (3-Benzoylphenyl) alkanoic acids. 3,641,127, Cl. 260-516.
Farnham, Norman W.; Mueller, William J.; and Gorall, Donald J., to Burroughs Corporation. Method of dry preparation of relief printing plates. 3,640,219, Cl. 101-401.1
Farnham, Robert A. Waste water purification. 3,640,686, Cl. 23-181.
Farnsworth, Robert P.; and McCaughey, Dennis G. Wide band boost regulator power supply. 3,641,422, Cl. 323-8.
Farrell, Guy M. Lamp socket construction. 3,641,481, Cl. 339-126.
Fassett, Matthew; and Unger, Phyllis S., to Stromberg-Carlson Corporation. Digital-to-analog and analog-to-digital signal translation with optical devices. 3,641,564, Cl. 340-347.
Fauran, Claude P.; Raynaud, Guy M.; Oliver, Rene A.; and Douzon, Colette A., to Delalande S.A. Derivatives of 5-carbamoyloxamethyl-3-substituted-2- oxazolidinones, process of preparation thereof and their therapeutic application. 3,641,036, Cl. 260-268.
Fay, Elliott J.: *See*—
Ritter, Ralph Kenneth; Pease, Charles C.; and Fay, Elliott J., 3,641,305.
Federal-Mogul Corporation: *See*—
Aho, Edwin, 3,640,594.
Feenstra, Robijn, to Shell Oil Company. Diamond bit. 3,640,356, Cl. 175-329.
Feest, Robert H., Jr.: *See*—
McKee, Lewis W.; and Feest, Robert H., Jr., 3,640,593.
Feldhoff, Heinrich: *See*—
Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgag; Fesamann, Heinz; and Hahn, Edeleried, 3,640,063.
Feldman, Nicholas: *See*—
Ilnyckyj, Stephan; Cole, John Charles O.; Feldman, Nicholas; and Strickland, Barney R., 3,640,691.
Fellers, John F.; Hinsch, James E.; and McLaughlin, Ernest O., to Ford Motor Company. Radiation-curable vinyl paint containing pendant unsaturation with intervening ether functionality. 3,641,210, Cl. 260-885.
Fenton, Donald M., to Union Oil Company of California. Hydrocarboxylation reaction to form straight-chain anhydrides. 3,641,071, Cl. 260-398.
Fenton, Donald M., to Union Oil Company of California. Carbonylation of olefins. 3,641,074, Cl. 260-410.9
Fenton, Donald M., to Union Oil Company of California. Preparation of methacrylic acid. 3,641,137, Cl. 260-526.
Ferguson, Jeremiah M., to Riley Stoker Corporation. Control of fluid flow through centrifugal pumps. 3,640,251, Cl. 122-406.
Ferguson, Robert M.: *See*—
Mammino, Joseph; and Ferguson, Robert M., 3,640,710.
Fernald, Herbert B.; Gall, William; and Hay, Russell G., to Gulf Research & Development Company. Method for reduction of polymer formation in a process for converting ethylene to alpha olefins. 3,641,191, Cl. 260-683.15
Fernholz, Hans; and Jacobsen, Gunter, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the manufacture of vinyl acetate. 3,641,113, Cl. 260-497.
Fernsch GmbH: *See*—
Krause, Gerhard, 3,641,363.
Ferrari, Andres: *See*—
Hurtig, Carl R.; Ferrari, Andres; and Khoury, Amin J., 3,640,267.
Ferrari, Andres, to Damon Corporation. Dialyzing liquid-collecting container. 3,640,388, Cl. 210-94. —
Ferri, John L.; and Mathers, James E., to Sylvania Electric Products, Inc. Rare earth oxide phosphor having a controlled decay time. 3,639,932, Cl. 252-301.4

Ferro Corporation: *See*—
Meek, William H., 3,641,045.

Fertig, Kenneth: *See*—
Cox, Duncan B., Jr.; and Fertig, Kenneth, 3,641,429.

Ferton, Jean-Yves; Hennebert, Jacques; and Strippoli, Francois, to Merlin Gerin Societe Anonyme. Polyphase circuit interrupter of the fluid blast puffer type. 3,641,295, Cl. 200-148.

Fessmann, Heinz: *See*—
Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgag; Fessmann, Heinz; and Hahn, Edeleried, 3,640,063.

Fettweis, Alfred Leo Maria, to International Standard Electric Corporation. Resonant transfer circuits. 3,641,271, Cl. 179-15.

Fiber Industries, Inc.: *See*—
Paliyenko, Paul; and Beier, Werner E., 3,640,670.

Fichtel & Sachs AG: *See*—
Spichala, Paul, 3,640,361.

Field, Anthony Gerard, deceased0 (by Field, Denis Cyril0Field, Madeleine Helen; administrators), to Abrasive Development Limited. Abrading machines. 3,640,023, Cl. 51-8.

Field, Denis Cyril: *See*—
Field, Anthony Gerard, 3,640,023.

Field, Lester M.; Walker, Richard A.; and McKee, William E., to Hughes Aircraft Company. Hydrophilic-hydrophobic photon sensitive medium. 3,640,712, Cl. 96-27.

Field, Madeleine Helen: *See*—
Field, Anthony Gerard, 3,640,023.

Field, Nathan D.; Randall, David I.; and Fitzpatrick, Jimmie D., to GAF Corporation. 2-Pyrrolidonyl polyacrolein bisulfite. 3,640,934, Cl. 260-29.4

Fieldgate, Ivan O., to Potter Instrument Company, Inc. Non-contacting keyboard and interlocking system. 3,641,567, Cl. 340-365.

Fijal, Walter R., to Basf Wyandotte Corporation. Sucrose-ethylene diamine polyols and process for preparing same. 3,640,997, Cl. 260-209.

Filipowicz, Leon: *See*—
Clarke, Michael Raymond; and Filipowicz, Leon, 3,640,931.

Findley, Harold J.; and Meier, James L., to Whittaker Corporation. Adhesive composition. 3,640,941, Cl. 260-33.6

Finelli, Anthony F., to Goodyear Tire & Rubber Company, The. Polyurethane composition and its use to form polystyrene laminates. 3,640,938, Cl. 260-32.8

Finical, Thomas N., Jr.: *See*—
Smith, Calvin S., Jr., 3,640,850.

Fink, Walter. Aromatic o-triorganosilyl-diorganoamino compounds and process. 3,641,088, Cl. 260-448.2

Finnegan, Walter D., to Kaiser Aluminum & Chemical Corporation. Roll bonding an aluminum-ferrous composite with grooved rolls. 3,639,974, Cl. 29-493.

Finney, James Harold. Levelling system for semi end dump trucks. 3,640,578, Cl. 298-17.

Fiocca, Louis L. Solid-state power supply system for rotating anode X-ray tubes. 3,641,408, Cl. 318-227.

Fiorenza, Giorgio: *See*—
Cortona, Alessandro; Musso, Pietro; Saltini, Fabrizio; and Fiorenza, Giorgio, 3,641,317.

Firestone, Raymond A., to Merck & Co., Inc. Method for the preparation of (cis-1,2- expoxypropyl) phosphonic acid derivatives. 3,641,065, Cl. 260-348.

First National Bank of Atlanta, The: *See*—
Brown, Warren F., 3,640,279.

Fisch, Willy: *See*—
Schmid, Rolf; Bucher, Ingrid; Fisch, Willy; and Batzer, Hans, 3,641,194.

Fischbach, Ronald. Retainer cap for a starter pinion. 3,640,148, Cl. 74-434.

Fischer, James R.: *See*—
Sweeny, Keith H.; and Fischer, James R., 3,640,821.

Fischer, Janos: *See*—
Rakoczi, Jozsef; Mikite, Gyula; Petocz, Lujza; Fischer, Janos; Grasser, Katalin; and Kosoczky, Ibolya, 3,641,039.

Fischer, Peter: *See*—
Hennig, Hans Joachim; and Fischer, Peter, 3,640,966.

Fisher, Arthur Miller. Humane animal traps. 3,640,015, Cl. 43-83.5

Fisher, Mahlon B., to United States of America, Air Force. Electronic lens for a photoelectron multiplier. 3,641,352, Cl. 250-207.

Fisher, Milton W.: *See*—
Henson, Glen E.; and Fisher, Milton W., 3,640,530.

Fitchman, Arthur E.; and Nathe, Raymond J., to Marathon Manufacturing Company. Cell terminal. 3,640,775, Cl. 136-134.

Fitzgerald, Thomas J.: *See*—
Lettre, Hans; and Fitzgerald, Thomas J., 3,641,146.

Fitzgerald, Walter P., Jr., to LRC Research and Development Company, mesne. Cleaning composition and method of using same. 3,640,879, Cl. 252-103.

Fitzgerald, William Vincent, Jr., to RCA Corporation. High frequency semiconductor device. 3,641,398, Cl. 317-234.

Fitzhugh, Guy D. Adapter for working implements. 3,640,641, Cl. 416-62.

Fitzpatrick, Jimmie D.: *See*—
Field, Nathan D.; Randall, David I.; and Fitzpatrick, Jimmie D., 3,640,934.

Flanigan, Richard J., to Gulf & Western Precision Engineering Company. Workpiece transfer mechanism for centerless grinder or the like. 3,640,026, Cl. 51-215.

Fleck, Paul H., to Urethane Fabricators, Inc. Method of producing a molded simulated wooden article. 3,641,228, Cl. 264-53.

Fleissner, Gerold: *See*—
Fleissner, Heinz; and Fleissner, Gerold, 3,639,955.

Fleissner, Heinz; and Fleissner, Gerold, to Vepa AG. Apparatus for crimping groups of synthetic filaments. 3,639,955, Cl. 28-1.6

Fleming, John W., Jr.; and McMullen, James Michael, to Industrial Nucleonics Corporation. Web sampling method and apparatus. 3,640,162, Cl. 83-52.

Flesch, Friedrich: *See*—
Querfeld, Hermann; Mattes, Heinz Otto; and Flesch, Friedrich, 3,640,043.

Flexian Hydraulics Ltd.: *See*—
Hart, Bernard Eaton, 3,640,647.

Flitsch, Ernst: *See*—
Gotzenberger, Rudibert, 3,640,311.

Florance, Douglas A.; Nordholm, Lloyd P.; and Foldes, Stephen. Automatic ground fault circuit interrupter. 3,641,393, Cl. 317-22.

Florschutz, Franz. People's helicopter. 3,640,488, Cl. 244-17.19

Florsheim, Leonard S., Jr.; Lieberman, David A.; Archer, Harold B.; and Nothmann, Gerhard A., to Enivar Enterprises, Inc., mesne. Automatic density setting apparatus. 3,640,623, Cl. 355-67.

Flynn, John Harold. Method of making polyolefin-paper laminate with flame treatment of the paper. 3,640,788, Cl. 156-82.

FMC Corporation: *See*—
Looker, Olin L., 3,640,055.
Lutz, Charles William, 3,640,827.
Reimers, James L., 3,640,375.
Stewart, Mary J.; and Price, John A., 3,640,964.
Traube, Robert J., 3,640,412.

Foldes, Stephen: *See*—
Florance, Douglas A.; Nordholm, Lloyd P.; and Foldes, Stephen, 3,641,393.

Foley, William R., Jr., to Teledyne, Inc. Method of hot rolling metal. 3,640,114, Cl. 72-365.

Fontijn, Wilhelmus J.; and van Drunen, Korstiaan J. M., to American Enka Corporation. Process for making multifilament yarns. 3,641,232, Cl. 264-171.

Forbes, Alan David; and Hunter, Neville John, to British Petroleum Company Limited, The. Anti-foam oil. 3,640,893, Cl. 252-321.

Forbes, Hampton E., Jr.; and La Freniere, Lawrence J., to Westvaco Corporation. Carton with separate interior pocket. 3,640,447, Cl. 229-17.

Forbes, Norman A.: *See*—
Griffin, James R.; and Forbes, Norman A., 3,639,920.

Ford Motor Company: *See*—
Fellers, John F.; Hinsch, James E.; and McLaughlin, Ernest O., 3,641,210.
Jania, Zbigniew J., 3,640,301.
Kepner, Larry A., 3,640,153.
Radin, Bernard G., 3,641,544.

Foroulis, Zisis Andrew, to Esso Research and Engineering Company. Inhibition of corrosion using alkyl aryl ketones. 3,640,895, Cl. 252-396.

Forshaw, Richard: *See*—
Glover, Peter David; Forshaw, Richard; and Steele, William Henry, 3,640,253.

Forsythe, Alan K., to Rocket Research Corporation. Method and apparatus for aspirating fluids. 3,640,645, Cl. 417-174.

Foster, Richard Gregory; Joy, David Richard; Hepworth, Paul; and Dart, Edward Charles, to Imperial Chemical Industries Limited. Production of polycyclic hydrocarbons. 3,641,173, Cl. 260-666.

Foster, Richard W.: *See*—
Kossen, Dale J.; Foster, Richard W.; and Benson, Charles R., 3,641,396.

Foster Wheeler Corporation: *See*—
Costello, Raymond M.; and Beckman, Eugene B., 3,640,250.

Fougeray, Jean: *See*—
Giffard, Louis; and Fougeray, Jean, 3,640,664.

Fournillon, Germain, to Electronique Marcel Dassault. Device for carrying a flat electronic apparatus by an aircraft. 3,641,252, Cl. 174-52.

Fox, Marvin L.; and Parry, James R. Insertable valve assembly. 3,640,304, Cl. 137-315.

Fram Corporation: *See*—
Brownell, Peter, 3,640,396.

Francis, Marion D., to Procter & Gamble Company, The. Compositions for inhibiting anomalous deposition and mobilization of calcium phosphate in animal tissue. 3,641,246, Cl. 424-204.

Franck, Heinz-Gerhard: *See*—
Ruhl, Karl; Franck, Heinz-Gerhard; and Turowski, Johannes, 3,641,166.

Frangos, John W. Portable sifting apparatus. 3,640,386, Cl. 209-337.

Frank, Victor S.; Lard, Edwin W.; and Stahly, Eldon E., to Grace, W. R., & Co. Burn-resistant plastic compositions. 3,641,193, Cl. 260-830.

Franklin, Clarence W. Sub-caliber adapter for firearm. 3,640,013, Cl. 42-77.

Frazier, Lauren L., to General Electric Company. Household refrigerator with exterior ice service. 3,640,089, Cl. 62-320.

Fredrickson, Donald M., to Bell & Howell Company. Sheet separating apparatus. 3,640,524, Cl. 271-36.

Fredrickson, Donald M.; and Bungener, Johannes H., to Bell & Howell Company. Toner doctor means. 3,640,617, Cl. 355-10.

Freed, Meier E.; and Hertz, Elisabeth, to American Home Products Corporation. 4,5-Dihydro-N-(4-phenyl-1-piperazinylcarbonyl-1H[1,4]diazepino[1,2-a]indole. 3,641,030, Cl. 260-268.

Freedman, Myron L. Method and apparatus for cleaning film. 3,640,293, Cl. 134-9.

Freeman, Hovey T., Jr.: *See*—
MacLean, Charles C., III; and Villa, Alfonso, 3,640,040.

Freeport Sulphur Company: *See*—
Smith, Jay Charles; and Reinhardt, James R., 3,640,682.

Freismuth, John S.; and Beneditti, Nello L., deceased0 (by Beneditti, Lena; executor), said Freismuth assor. to Eaton Yale & Towne, Inc. Forward poppet thermostat. 3,640,454, Cl. 236-34.

Frerson, Raymond; Gravier, Claude; Ravenel, Pierre; and Soupene, Pierre, to Electricite de France (Service National). Viewer-projector-copier apparatus for microforms. 3,640,621, Cl. 355-45.

Frey, Hans: *See*—
Muller, Richard; Frey, Hans; and Datbe, Christian,3,641,082.

Friberg, Nelson A., to International Assembly Corporation. Centrally located access alarm system. 3,641,552, Cl. 340-274.

Frick, Hughie R.: *See*—
Anderson, Richard W.; and Frick, Hughie R.,3,641,020.

Fried, John H.; and Harrison, Ian T., to Syntex Corporation. Naphthyl alkanols. 3,641,161, Cl. 260-613.

Friedman, Abraham. Collapsible shopping cart. 3,640,547, Cl. 280-36.

Friedman, Benjamin. Hypodermic syringe device which maintains sterile condition of needle. 3,640,278, Cl. 128-218.

Friedman, Jerome. Rotary marking tools. 3,640,212, Cl. 101-7.

Friedman, Lester; Rattenbury, Kenneth H.; and Guttag, Alvin, to Weston Chemical Corporation. Hydrogenated bis phenol diphosphites. 3,641,218, Cl. 260-928.

Frind, Horst; Heid, Christian; and Aman, Horst, to Cassella Farbwerke Mainkur Aktiengesellschaft. Process for the production of reduced sulfur dyes. 3,640,803, Cl. 204-73.

Fripp, Alan: *See*—
Lloyd, John George; and Fripp, Alan,3,641,501.

Frischkorn, Hans; Pintschovius, Ulrich; Schinzel, Erich; and Smerz, Otto, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Naphthylene-bis-2-benzimidazoles. 3,641,051, Cl. 260-309.2

Fritsch, Werner: *See*—
Radscheit, Kurt; Stache, Ulrich; Haede, Werner; Fritsch, Werner; and Lindner, Ernst,3,641,009.

Fritz, Richard C.; and Galvanoni, Aldo B., to Phillips Petroleum Company. Packaging with heat shrinkable film. 3,640,049, Cl. 53-30.

Froehlich, Alfred, to Ciba Limited. Hardeners for water-soluble polymers. 3,641,116, Cl. 260-482.

Frohman-Bentchkowsky, Dov, to Fairchild Camera and Instrument Corporation. Integrated MNOS memory organization. 3,641,512, Cl. 340-173.

Frye Industries, Inc.: *See*—
Hsia, Shwang, 3,640,861.

Fuchs, Otto, to Dynamit Nobel AG. Process for the manufacture of foam materials containing plasticizers and made of polyvinyl chloride and copolymers of vinyl chloride. 3,640,918, Cl. 260-2.5.

Fueslein, Jerome L., to International Harvester Company. Double acting depth stop. 3,640,346, Cl. 172-318.

Fuji Photo Film Co., Ltd.: *See*—
Nagae, Tadashi; Oishi, Yasushi; and Hayashi, Jun, 3,640,716.

Fuji Shashin Film Kabushiki Kaisha: *See*—
Ishiwata, Mamoru; and Akio, Huruya, 3,640,752.

Fujie, Hiroshi: *See*—
Ozawa, Shuji; and Fujie, Hiroshi,3,640,970.

Fujii, Minoru, to Nippondenso Kabushiki Kaisha. Ignition timing pulse generator for a contactless ignition system of internal combustion engines. 3,641,377, Cl. 310-153.

Fujimoto, Ted Y., to North American Rockwell Corporation. Multiphase field effect transistor driver multiplexing circuit. 3,641,366, Cl. 307-251.

Fujimura, Noriaki, to Fujitsu Limited. L-C oscillator tunable by external DC voltage through phase shifted feedback network. 3,641,462, Cl. 331-117.

Fujita, Tadamasa: *See*—
Kosaka, Masahiro; and Fujita, Tadamasa,3,641,507.

Fujitsu Limited: *See*—
Fujimura, Noriaki, 3,641,462.
Kobayashi, Toshio; and Mineshima, Yukihiko, 3,641,562.
Maegawa, Harumi; Sato, Yohihiro; Furuhata, Yasuo; and Kiumi, Takayuki, 3,641,522.
Sasaki, Hiroshi; Maruyama, Tatsuo; Kanzaki, Hisao; and Sakamoto, Yasuhiko, 3,641,274.

Fukata, Masayuki. Broadcast system for a control signal with interference reduction. 3,641,436, Cl. 325-64.

Fukumitsu, Minoru. Flowing-light devices. 3,640,011, Cl. 40-133.

Fukunaga, Tadayuki: *See*—
Sugahara, Takashi; Suzuki, Minoru; Fukunaga, Tadayuki; and Fukushima, Shozo,3,640,069.

Fukushima, Shozo: *See*—
Sugahara, Takashi; Suzuki, Minoru; Fukunaga, Tadayuki; and Fukushima, Shozo,3,640,069.

Fulk, James B. Matched plate method for printing on multiple paper parts. 3,640,220, Cl. 101-426.

Fuller, Ralph A.: *See*—
Fuller, Ralph A.; and Snodgrass, Earl D., 3,640,190.

Fuller, Ralph A.; and Snodgrass, Earl D., to Waterman, Herrick, Fuller, Ralph A., and Snodgrass, Earl D. Carton handling method. 3,640,190, Cl. 93-94.

Fuller, Roger L.: *See*—
Bushnell, David; Fuller, Roger L.; and Oliver, Joseph J.,3,641,569.

Fulton, Thomas Philip; and Di Luca, Henry, to RCA Corporation. Encapsulated magnetic memory element. 3,640,767, Cl. 117-234.

Fumai Electric Company, Limited: *See*—
Hata, Kiyoshi, 3,640,479.

Furniture City Manufacturing Corporation: *See*—
Hepfer, Ivan C., 3,640,789.

Furst, Stefan, to Reiners, Walter. Coil winding machine. 3,640,477, Cl. 242-18.

Furuhata, Yasuo: *See*—
Maegawa, Harumi; Sato, Yohihiro; Furuhata, Yasuo; and Kiumi, Takayuki,3,641,522.

Furukawa, Junji; and Morikawa, Hiroyuki, to Mitsubishi Petrochemical Company Limited. Production of cyclic trimers of dienes. 3,641,187, Cl. 260-666.

Furukawa, Kaoru: *See*—
Hamanaka, Yasushi; Tajiri, Hiromi; Etoh, Kuniomi; Furukawa, Kaoru; and Masai, Yukito,3,640,761.

Gaertner, Friedhelm: *See*—
Gaeth, Rudolf; Stastny, Fritz; Breu, Rudolf; and Gaertner, Friedhelm,3,640,837.

Gaeth, Rudolf; Stastny, Fritz; Breu, Rudolf; and Gaertner, Friedhelm, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Thermally insulating transparent laminated glass with alkali metal silicate interlayer. 3,640,837, Cl. 161-165.

GAF Corporation: *See*—
Field, Nathan D.; Randall, David I.; and Fitzpatrick, Jimmie D., 3,640,934.
Mackey, E. Scudder, 3,640,748.
Smith, Edward A.; and Baldwin, Arnold V., 3,640,392.

Gaines, Brian R.; and Shemer, Raymond A., to International Standard Electric Corporation. Phase shift detector. 3,641,447, Cl. 329-126.

Gaines, George L., Jr.: *See*—
Bostick, Edgar E.; Gaines, George L., Jr.; and Le Grand, Donald G.,3,640,943.

Galantay, Eugene E.; and Ott, Hans, to Sandoz-Wander, Inc. Intermediates in the preparation of 4- aminodibenzo[a,d]-cycloalken-5-ones. 3,641,133, Cl. 260-518.

Galasso, Francis S.; and Veltri, Richard D., to United Aircraft Corporation. Method for forming silicon compound fibers. 3,640,693, Cl. 65-2.

Galbraith, Lyle D.; and Thron, William E., to Rocket Research Corporation. Generator of cool working gases. 3,640,083, Cl. 62-52.

Gall, William: *See*—
Fernald, Herbert B.; Gall, William; and Hay, Russell G.,3,641,191.

Gallagher, Frederick James. Aerosol valve for use in high rate pressure filling of a container. 3,640,436, Cl. 222-402.2

Gallaway, William S.: *See*—
Beattie, Willard H.; and Gallaway, William S.,3,640,627.

Gallet, Jacques Henri; and Gracia, Robert Francis, to Itek Corporation. Photographic reversal process employing organic mercaptan compounds. 3,640,717, Cl. 96-59.

Galvanoni, Aldo B.: *See*—
Fritz, Richard C.; and Galvanoni, Aldo B.,3,640,049.

Galy, Michel, to Societe Anonyme dite: Institut Merieux. Package for ampoules containing lyophilized products. 3,640,437, Cl. 225-96.5

Gamble, Edward Bernard, to RCA Corporation. Logic gate. 3,641,362, Cl. 307-215.

Gamble, Edward Bernard; and Aires, Ramon Hess, to RCA Corporation. Logic circuit which turns on and off rapidly. 3,641,368, Cl. 307-254.

Ganske, Kingston E., to Arvin Industries, Inc. Television recording system with alternate period inversion and automatic frequency control. 3,641,265, Cl. 178-6.6

Ganske, Kingston E., to Arvin Industries, Inc. Reversible tape transport with interlocked head position and tape direction control. 3,641,279, Cl. 179-100.2

Garcea, Giampaolo, to Alfa Romeo S.p.A. Regulator for gasoline injection pumps. 3,640,259, Cl. 123-140.

Gardner, Dayne G.: *See*—
Keller, Michael I.; and Gardner, Dayne G.,3,641,276.

Gardner, Irving. Device for measuring the ring size of a finger. 3,639,995, Cl. 33-179.

Gardner, Lawrence J.; and Cochren, Donald R., to Protective Pads, Inc. Protective body pad. 3,640,831, Cl. 161-92.

Gardner-Denver Company: *See*—
Coyne, Merton W.; and Palauro, Dieter K., 3,640,351.

Garfinkel, Marvin: *See*—
Brown, Dale M.; and Garfinkel, Marvin,3,640,782.

Garnett, John Baron: *See*—
Rees, Donald Frank; Garnett, John Baron; and Richardson, Michael Alexander,3,640,076.

Garrison, Arthur W.: *See*—
Case, Forrest N.; Garrison, Arthur W.; Kau, Donald L.; and Smiley, David E.,3,640,808.

Garziera, Gastone: *See*—
De Sandre, Giovanni; and Garziera, Gastone,3,641,329.

Gasior, Joseph; and Kovacs, Lloyd, to Midland-Ross Corporation. Continuous-parison blow-molding apparatus. 3,640,661, Cl. 425-159.

Gates, Harlan R.: *See—*
Castrucci, Paul P.; Gates, Harlan R.; Henle, Robert A.; Pricer, Wilbur David; Morton, Robert M.; Mason, John W.; and North, William D.,3,641,516.

Gates, John W., Jr.; Wise, Albert W.; Beavers, Dorothy J.; and Miller, Paul E., to Eastman Kodak Company. Derivatives of thiourazoles. 3,641,046, Cl. 260-308.

Gaul, Robert G., to Paragon Wire & Cable Corporation. Lubricating system for braiding machines. 3,640,176, Cl. 87-33.

Gault, Robert H., to Bethlehem Steel Corporation. Oil well pumping unit having traveling stuffing box. 3,640,342, Cl. 166-72.

G.D. Societa in Accomandita Semplice di Enzo Seragnoli e Artosto Seragnoli: *See—*
Seragnoli, Ariosto, 3,640,373.

Geigy Chemical Corporation: *See—*
Schinkler, Walter; and Zust, Armin, 3,641,031.

Geis, David G., to Teletype Corporation. Friction testing apparatus and methods. 3,640,118, Cl. 73-9.

Geiser, Edward M., to Universal Oil Products Company. Sheet material. 3,640,629, Cl. 401-132.

Gemmill, Robert M., Jr.; Schick, John W.; and Mobil Oil Corporation, to Lubricant compositions comprising substituted. indans. 3,640,870, Cl. 252-59.

Gendler, Irvin F., to Murphey, Daniel F. Horseshoe game device with recessed stake areas. 3,640,535, Cl. 273-126.

Gendron, Everett W. Illuminated belt. 3,641,333, Cl. 240-6.4

General Dynamics Corporation: *See—*
Cupp, Frederick B.; and Whiting, John S., 3,641,506.

General Electric Company: *See—*
Anderson, Richard C., 3,640,887.
Barnett, Richard C., 3,640,264.
Blackburn, Richard D., 3,641,546.
Bostick, Edgar E.; Gaines, George L., Jr.; and Le Grand, Donald G., 3,640,943.
Bostick, Edgar E.; and Zdaniewski, Joseph J., 3,641,090.
Brown, Dale M.; and Garfinkel, Marvin, 3,640,782.
Brown, Dale M.; and Engeler, William E., 3,641,405.
Chen, Arthur C. M., 3,641,510.
Frazier, Lauren L., 3,640,089.
Graf, Carlton Eugene; Skogsholm, Einar Aasen; and Volkmann, Werner Karl, 3,641,421.
Heartz, Robert Alan, 3,641,531.
Hughes, Philip G., 3,641,287.
Jacobus, Dwight W.; and Simms, Michael L., 3,640,088.
Konrad, Charles E.; and Chausse, Burnette P., 3,641,566.
Liao, Tseng W., 3,641,251.
McCarty, Orin P., 3,641,359.
Plette, David L., 3,641,418.
Ringeman, Othmar E., 3,641,381.
Spalding, James R., 3,640,363.
Stephens, Joe F., 3,641,380.
Tefft, Edward G., 3,639,975.
Van der Grinten, Willem J.; and Jernakoff, George, 3,641,340.
Wanger, Robert P., 3,640,487.

General Foods Corporation: *See—*
Grieve, Harold R., 3,640,446.
Kaplow, Milton; and Klose, Robert E., 3,640,731.

General Instrument Corporation: *See—*
White, Donald J.; and Navin, William R., Jr., 3,641,484.

General Mills, Inc.: *See—*
Johnson, Ernest W., 3,640,732.
Kuder, Robert C., 3,641,144.

General Motors Corporation: *See—*
Cunning, Alfred C.; and Wolverton, Harry D., 3,640,128.
Hayes, Charles F.; and Steffey, David R., 3,640,469.
Schaefer, Robert H., 3,640,157.

General Refractories Company: *See—*
Bakker, Wate T., 3,640,739.

General Signal Corporation: *See—*
Auer, John H., Jr.; and Huffman, Jerry P., 3,641,575.

Gentry, Robert R.: *See—*
Peck, David W.; and Gentry, Robert R.,3,641,115.

Geomet, Incorporated: *See—*
Anderson, Howard H.; Moyer, Rudolph H.; Sibbett, Donald J.; and Sutherland, David C., 3,640,624.

Georg, Otto. Multiple-screw fly press. 3,640,210, Cl. 100-53.

Geraldo, Antonio A., to Phillips Petroleum Company. Stabilized highly aromatic oil masterbatches of coupled solution polymers. 3,640,939, Cl. 260-33.6

Gersch, Richard C.; and Reynolds, Roland Bruce. Adjustable boring quill assembly. 3,640,633, Cl. 408-12.

Gewerkschaft Eisenhutte Westfalia: *See—*
Rassmann, Christoph; and Heyer, Willy, 3,640,581.

Gewertz, Harry R.; and Read, George D., to Ajax Hardware Manufacturing Corporation. Auxiliary lock for swinging doors. 3,640,558, Cl. 292-264.

Giardini, Dante S.; Preston, George A.; and Roney, Richard N., to Bendix Corporation, The. Method of severing filamentary material. 3,640,163, Cl. 83-53.

Gibson, William R.: *See—*
Palm, Clifford W.; and Gibson, William R.,3,640,064.

Giddings, David George; and Twist, Douglas, to Pilkington Brothers Limited. Method of toughening glass in an oil bath. 3,640,694, Cl. 65-116.

Gieseke, Elmer William; and Howald, Frank Peterson, to American Cyanamid Company. Liquid cationic flotation composition. 3,640,862, Cl. 252-61.

Giess, Edward A.: *See—*
Burns, Gerald; Giess, Edward A.; and O'Kane, Daniel F.,3,640,865.

Giffard, Louis; and Fougeray, Jean. Shaping molds for producing film-like articles. 3,640,664, Cl. 425-275.

Giglio, John W. Tone modifier and muffler for piano. 3,640,171, Cl. 84-216.

Gilbo, Charles F.; and Johnson, Norman A., to Armstrong Cork Company. Apparatus and method of installing a spline in a ceiling board joint. 3,640,045, Cl. 52-747.

Gilbreth International Corporation: *See—*
Sakurai, Masao, 3,640,417.

Gillemot, George W.: *See—*
Thompson, John T.; and Gillemot, George W.,3,639,952.

Gillette Company, The: *See—*
Corbett, John Frank; and Amery, Geoffrey Wilfred, 3,641,154.

Gioia, Norman F.: *See—*
Beck, Fred R.; Fanella, Robert J.; and Gioia, Norman F.,3,640,483.

Girard, Christian F.; and Derouin, Gerald J., to Canadian International Paper Company. Water absorption test method. 3,640,125, Cl. 73-73.

Girling Limited: *See—*
Ingram, Brian, 3,640,067.

Gisser, Henry: *See—*
Messina, Joseph F.; and Gisser, Henry,3,640,859.

Gladding, Edward Karcher: *See—*
Anderson, Daniel Gustav; Gladding, Edward Karcher; and Sullivan, Raymond,3,641,104.

Glaski, Frederick A.; Holzl, Robert A.; and Kaplan, Richard B., to Fansteel Inc. Composite hard metal product. 3,640,689, Cl. 29-195.

Gleason Works, The: *See—*
Clarke, James F.; and Deprez, Thomas A., 3,640,030.
Pigage, Robert F.; Ryan, Arthur B.; and Smith, Robert E., 3,641,431.

Glickman, Joel L.: *See—*
Cutler, Joel L.; and Glickman, Joel L.,3,641,540.

Glickman, Joel L.: *See—*
Cutler, Joel L.; and Glickman, Joel L.,3,641,425.

Gloskey, Carl Robert, to M&T Chemicals Inc. Non-toxic stabilized polyvinyl chloride products and stabilizer compositions. 3,640,947, Cl. 260-45.75

Glover, Peter David; Forshaw, Richard; and Steele, William Henry, to Victa Limited. Carburettor throttle control assembly. 3,640,253, Cl. 123-102.

Gluntz, Claude; Meyer, Pierre, and Peyrot, Jean, to Compagnie Francaise de Raffinage. Process for the eliminating of compounds with acid function dissolved in a liquid medium. 3,640,982, Cl. 260-88.2

Gobel, Wilhelm: *See—*
Weitzel, Hans; Dinges, Karl; Gobel, Wilhelm; and Hardt, Dietrich,3,641,206.

Gobert, Michael R. R. Detergent. 3,640,877, Cl. 252-99.

Godbersen, Byron L. Float plane hoist. 3,640,403, Cl. 214-1.

Godec, Maksimiljan: *See—*
Zawadzki, George Z.; and Godec, Maksimiljan,3,640,560.

Godfrey, Norman Bell: *See—*
Bentley, Floyd Edward; and Godfrey, Norman Bell,3,639,928.

Godmer, Laurent. Naval combat board game apparatus. 3,640,536, Cl. 273-130.

Golde, H. T., GmbH: *See—*
Kouth, Herbert; and Marr, Fritz, 3,640,022.

Golden, Gerald J. Windshield cleaning system. 3,639,938, Cl. 15-250.06

Goldmann, Gerhard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Soil conditioner and garden mold on the basis of coffee extraction residue. 3,640,696, Cl. 71-9.

Golick, Alex James: *See—*
Stephan, John T.; and Golick, Alex James,3,640,740.

Goller, Heinz, to Osterreichische Stickstoffwerke Aktiengesellschaft. Method of producing acid of low phosphorus content from waste gases. 3,640,685, Cl. 23-153.

Gonzenbach, Carlos T.; and Jordan, Manuel A., to Schenectady Chemicals, Inc. Interpolymers prepared from vinyl toluene, alpha methyl styrene, dicyclopentadiene and optionally and acrylic compound. 3,640,977, Cl. 260-80.78

Gooder, Robert M. System for fabricating structural members. 3,639,962, Cl. 29-155.

Goodman, Robert C.: *See—*
Zimmerman, Burton R.; Bodley, Roger W.; and Goodman, Robert C.,3,640,195.

Goodrich, B. F., Company, The: *See—*
Kuster, Howard L., 3,640,564.

Goodspeed, Neil C.: *See—*
Dietz, Albert; Goodspeed, Neil C.; and May, Russell R., Jr.,3,640,744.

Goodyear Tire & Rubber Company, The: *See—*
Bilderback, John W., 3,640,975.
Finelli, Anthony F., 3,640,938.
Throckmorton, Morford C., 3,640,989.
Watters, Larry H., 3,640,769.

Gorall, Donald J.: *See*—
Farnham, Norman W.; Mueller, William J.; and Gorall, Donald J.,3,640,219.

Gordon Engineering Company: *See*—
Rigby, Sherman, 3,641,543.

Gordon, Hayden S., to United States of America, Air Force. Polyertic cyclotron. 3,641,446, Cl. 328-228.

Gordon, Robert A., to Eastman Kodak Company. Photographic web processing device. 3,640,204, Cl. 95-94.

Gorinas, Guy Georges: *See*—
Brilman, Michel Edmond Francis; Campagne, Jean-Pierre Alain; and Gorinas, Guy Georges,3,641,517.

Gotshall, William W. Using ground carbon in oil phase masterbatching. 3,640,940, Cl. 260-33.6

Gotte, Ernst, to Henkel & Cie GmbH. Skin protective washing and cleansing compositions. 3,640,883, Cl. 252-545.

Gotzenberger, Rudibert, to Flitsch, Ernst. Circulating valves. 3,640,311, Cl. 137-137.4

Gould, Francis E.; and Shepherd, Thomas H., to National Patent Development Corporation. Zero order release constant elution rate drug dosage. 3,641,237, Cl. 424-16.

Gouttebel, Raymond P.: *See*—
Pinet, Andre E.; and Gouttebel, Raymond P.,3,641,272.

Goy, Thomas J.; Knieriemen, Richard P.; and Reading, James E., to Torite Enterprises, Inc. Replaceable cartridge filter housing. 3,640,390, Cl. 210-130.

Grace, W. R., & Co.: *See*—
Frank, Victor S.; Lard, Edwin W.; and Stahly, Eldon E., 3,641,193.
Guthrie, James L., 3,640,923.
Price, Raymond E.; and Tirrell, Clifford F., 3,639,968.
Scanlon, Patricia M.; and Young, Elwyn Richard, 3,641,103.

Gracia, Robert Francis: *See*—
Gallet, Jacques Henri; and Gracia, Robert Francis,3,640,717.

Graf, Carlton Eugene; Skogsholm, Einar Aasen; and Volkmann, Werner Karl, to General Electric Company. Commutation control for inverter circuits. 3,641,421, Cl. 321-12.

Graflex, Inc.: *See*—
Balmes, Michael J., 3,640,603.

Grafmuller, Fritz, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Method for the consolidation of soil. 3,640,021, Cl. 47-9.

Graham, Donald P., to Hercules Incorporated. Booster-cap assembly. 3,640,222, Cl. 102-24.

Grampp, Ekkehard: *See*—
Uhlig, Helmut; and Grampp, Ekkehard,3,640,723.

Granskog, Roland, to Linden-Alimak Aktiebolag. Stoping apparatus. 3,640,349, Cl. 173-32.

Grant, Jon H.; and Bales, Walter D., to Hughes Aircraft Company. Precision fast analog switch. 3,641,365, Cl. 307-241.

Graphic Sciences, Inc.: *See*—
Von Hippel, Eric A., 3,640,482.

Grasser, Katalin: *See*—
Rakoczi, Jozsef; Mikite, Gyula; Petocz, Lujza; Fischer, Janos; Grasser, Katalin; and Kosoczky, Ibolya,3,641,039.

Gratzmuller, Jean Louis. Circuit breaking technique and device. 3,641,357, Cl. 307-94.

Gravier, Claude: *See*—
Frerson, Raymond; Gravier, Claude; Ravenel, Pierre; and Soupene, Pierre,3,640,621.

Gray, Frederick William, to Colgate-Palmolive Company. Bleaching and detergent compositions. 3,640,874, Cl. 252-95.

Gray, Reginald I.: *See*—
Petrick, John T.; and Gray, Reginald I.,3,640,224.

Greanias, Evon C.; and Levine, Wilbur J., to International Business Machines Corporation. Voice entry system. 3,641,500, Cl. 340-152.

Great Lakes Chemical Corporation: *See*—
Carroll, William J.; and Mizusawa, Frank S., 3,640,234.
Thomas, Robert M.; and Sands, John L., 3,641,041.

Green, Joseph A., to International Telephone and Telegraph Corporation. Frequency analyzer. 3,641,445, Cl. 328-140.

Green, Norman; Greenhouse, Harold M.; Vergara, William C., and McGill, Robert L., Jr., to Bendix Corporation. Temperature controlled microcircuits. 3,641,372, Cl. 307-310.

Greenhouse, Harold M.: *See*—
Green, Norman; Greenhouse, Harold M.; Vergara, William C.; and McGill, Robert L., Jr.,3,641,372.

Grenchen, Canton: *See*—
Lederrey, Marc; and Grenchen, Canton,3,640,065.

Grewe, Ferdinand: *See*—
Dabritz, Erich; Schafer, Werner; Grewe, Ferdinand; and Scheinpflug, Hans,3,641,043.

Grieve, Harold R., to General Foods Corporation. Carton with tuck-in closure flap. 3,640,446, Cl. 229-17.

Griffin, James R.; and Forbes, Norman A., to American Standard Inc. Programmed plumbing service. 3,639,920, Cl. 4-166.

Griffin, John R., to Tektronix, Inc. Computer terminal apparatus. 3,641,555, Cl. 340-324.

Griffin, Robert M.: *See*—
Audesse, Emery G.; Griffin, Robert M.; Tartakoff, Alexander; and Gutta, John J.,3,641,386.

Griffing, Brandt M., to International Business Machines Corporation. Pulse driving circuit for inductive load. 3,641,367, Cl. 307-252.

Griffith, Richard McDonald: *See*—
Holland, William Dean; Schmitt, Joseph Michael; and Griffith, Richard McDonald,3,641,197.

Griffiths, Wilfred, to Abrasive Aids Pty. Limited. Roller and method of making same. 3,639,958, Cl. 29-130.

Groce, Larry A. Overcurrent-fault indicator apparatus for truck lines of an electrical power distribution system. 3,641,548, Cl. 340-253.

Grosjean, Pierre, to Societe Rhodiaceta. Polyamides containing antistatic polyolefins having pendant polyoxyalkylene chains. 3,641,198, Cl. 260-857.

Grottrup, Helmut: *See*—
Dethloff, Jurgen; and Grottrup, Helmut,3,641,316.

Grove Manufacturing Company: *See*—
Sterner, Russell L.; and Lowe, William L., 3,641,551.

Grove, Marvin H.; Kim, Kee W.; and Van Arsdale, Lyle R., to M&J Valve Company. Valve apparatus having leak detecting means. 3,641,542, Cl. 340-238.

Groves, William L., Jr., to Continental Oil Company. Sulfosuccinate half ester lime soap dispersing agents. 3,640,882, Cl. 252-121.

Grow, Richard W.: *See*—
Price, Vernon G.; and Grow, Richard W.,3,641,465.

Grubba, Donald C., to Avco Corporation. Flame deposited oxide coating and method of making same. 3,640,757, Cl. 117-93.1

Grunzweig & Hartmann Aktiengesellschaft: *See*—
Eberle, Hans; and Wuttke, Gerhard, 3,640,921.

Gruppo Lepetit S.p.A.: *See*—
Nathansohn, Giangiacomo; Odasso, Gianfranco; De Ruggieri; and Guzzi, Umberto, 3,641,007.

Gruss, Hansgeorg: *See*—
Hampel, Gerald; and Gruss, Hansgeorg,3,640,663.

Guark, Richard J.; and Reicher, Milton D., to International Telephone and Telegraph Corporation. Maximal-ratio diversity receiving system. 3,641,437, Cl. 325-305.

Guinn, Frank; and Baba, George P. Signal flag. 3,640,242, Cl. 116-173.

Gulf & Western Precision Engineering Company: *See*—
Flanigan, Richard J., 3,640,026.

Gulf Research & Development Company: *See*—
Bacha, John D.; and Selwitz, Charles M., 3,641,168.
Bull, Willard C.; and Schmid, Bruce K., 3,640,816.
Cant, Noel W.; and Hall, William K., 3,641,139.
Cupples, Barrett L.; and Murphy, Clarence R., 3,640,852.
Fernald, Herbert B.; Gall, William; and Hay, Russell G., 3,641,191.
Hay, Russell G.; McNulty, John G.; and Walsh, William L., 3,641,086.
Heilman, William J., 3,641,201.
Ondrey, John A.; and Swift, Harold E., 3,641,138.
Onopchenko, Anatoli; Schulz, Johann G. D.; and Seekircher, Richard, 3,641,135.
Onopchenko, Anatoli; Schulz, Johann G. D.; and Seekircher, Richard, 3,641,136.
Rocchini, Albert G.; and Trautman, Charles E., 3,640,868.
Schulz, Johann G. D.; and Seekircher, Richard, 3,641,132.
Swift, Harold E., 3,641,121.

Gulick, Ronald A.; and Wicke, Charles H., to Research Engineering Company. Actuator. 3,640,140, Cl. 74-89.15

Gulistan, Bulent, to Deutsch Fastener Corporation. Method of producing a captive jacking screw. 3,639,971, Cl. 29-437.

Gunn, David L.; and Hanus, George M., to Motorola, Inc. Frequency conversion module including emitter follower mixer. 3,641,441, Cl. 325-430.

Gurka, Philip W. Fish hook with weed guard. 3,640,014, Cl. 43-42.43

Gustavsson, Karl-Axel Goran, to Aktienbolaget Bahco Ventilation. Apparatus for cleansing flue gases. 3,640,053, Cl. 55-227.

Guthrie, James L., to Grace, W. R., & Co. Polycnes cured with polythiols with iron compounds and oxime esters as accelerators. 3,640,923, Cl. 260-13.

Gutta, John J.: *See*—
Audesse, Emery G.; Griffin, Robert M.; Tartakoff, Alexander; and Gutta, John J.,3,641,386.

Guttag, Alvin: *See*—
Friedman, Lester; Rattenbury, Kenneth H.; and Guttag, Alvin,3,641,218.

Guzzi, Umberto: *See*—
Nathansohn, Giangiacomo; Odasso, Gianfranco; De Ruggieri; and Guzzi, Umberto,3,641,007.

Gyi, Ko Ko, to Burroughs Corporation. Pneumatic head actuating system having automatic control for reading and writing through heads. 3,641,527, Cl. 340-174.1

Gyugyi, Laszlo, to Westinghouse Electric Corporation. Input filter circuit for cycloconverter apparatus. 3,641,417, Cl. 321-7.

Haas, Werner E. L., to Xerox Corporation. Adhesive contact electrification imaging. 3,640,746, Cl. 117-17.5

Habata, Hidetsugu: *See*—
Kimura, Isao; and Habata, Hidetsugu,3,639,953.

Habermeier, Juergen: *See*—
Porret, Daniel; Habermeier, Juergen; and Batzer, Hans,3,640,910.

Habia Kommanditbolag: *See*—
Waage, Bard Meyer, 3,639,960.

Hadden, Edward H., to Olin Mathieson Chemical Corporation. Hollow spherical ice bodies and method of making the same. 3,640,081, Cl. 62-1.

Hadron, Inc.: *See*—
Duffy, Joseph J.; and Sims, Stuart Donald, 3,641,307.

Haede, Werner: *See*—
Radscheit, Kurt; Stache, Ulrich; Haede, Werner; Fritsch, Werner; and Lindner, Ernst,3,641,009.

Hahn, Edeleried: *See*—
Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgag; Fessmann, Heinz; and Hahn, Edeleried,3,640,063.

Hahn, Robert S.; and Keefe, Thomas R., to Heald Machine Company, The. Machine tool. 3,640,138, Cl. 74-89.15

Halberstam, Mendel M.: *See*—
Petropoulas, Spyros K.; Jehle, Robert E.; and Halberstam, Mendel M.,3,641,350.

Hall, Richard H.; Roberts, Carleton W.; Sikkema, Andrew J.; and Lawson, Junior J., to Dow Chemical Company, The. Transparent compositions of vinyl halide polymers and tertiary alkyl styrene-a crylonitrile-butadiene rubber polymers and method of making the same. 3,641,208, Cl. 260-876.

Hall, William K.: *See*—
Cant, Noel W.; and Hall, William K.,3,641,139.

Halls, Kenneth F.; and Brickley, Alfred H., to Space Tool, Inc. Adjustable jaw wrench. 3,640,159, Cl. 81-165.

Halstead, William M. Handling and heat dissipating device for electrical components. 3,640,519, Cl. 209-254.

Hamanaka, Yasushi; Tajiri, Hiromi; Etoh, Kuniomi; Furukawa, Kaoru; and Masai, Yukito, to Toyo Boseki Kabushiki Kaisha. Method for attaching additive to polyamide pellets. 3,640,761, Cl. 117-100.

Hamel G.m.b.H., Zwirnmaschinen: *See*—
Eckholt, Heinrich, 3,640,144.

Hamilton, John F.; and Pederson, Donald J., to Hercules Incorporated. Maintenance of slurry explosive pumping assembly for successive loadings. 3,640,585, Cl. 302-17.

Hammann, Ingeborg: *See*—
Buchel, Karl-Heinz; Draber, Wilfried; Hammann, Ingeborg; and Unterstenhofer, Gunter,3,641,098.
Schlor, Hanshelmut; Hammann, Ingeborg; and Homeyer, Bernhard,3,641,223.
Schrader, Gerhard; Hammann, Ingeborg; and Stendel, Wilhelm,3,641,221.

Hammer, Marvin H. Device for sequentially dispensing sets of sheets. 3,640,426, Cl. 221-67.

Hamner, Glen P., to Esso Research and Engineering Company. Hydroforming naphthas. 3,640,818, Cl. 208-65.

Hampel, Gerald; and Gruss, Hansgeorg, to Optipatent AG. Device for filling casting moulds with hardenable casting resin. 3,640,663, Cl. 425-233.

Hand, Clare R.: *See*—
Pews, Richard Garth; Hand, Clare R.; and Roberts, Carleton W.,3,641,160.

Handschuh, Volkmar: *See*—
Arlt, Dieter; and Handschuh, Volkmar,3,641,094.

Haney, Eugene E., to Armco Steel Corporation. Coated wire for use in prestressed concrete structures and method of producing same. 3,640,776, Cl. 148-6.16

Hannah, Bruce R.: *See*—
Morrison, Andrew Ivar; and Hannah, Bruce R.,3,640,576.

Hannon, John G.: *See*—
Ernest, Dale S., 3,640,266.

Hanscom, Genevieve L.: *See*—
Elliott, Melvin R., 3,640,378.

Hanslik, Wilhelm, to Dorplastex A.G. Multiple screw extruder. 3,640,669, Cl. 425-376.

Hanson, Newell B., to Hanson Silo Company. Silage distribution apparatus. 3,640,409, Cl. 214-17.

Hanson Silo Company: *See*—
Hanson, Newell B., 3,640,409.

Hanus, George M.: *See*—
Gunn, David L.; and Hanus, George M.,3,641,441.

Hardman Aerospace: *See*—
Karlsen, Asbjorn, 3,640,570.

Hardt, Dietrich: *See*—
Weitzel, Hans; Dinges, Karl; Gobel, Wilhelm; and Hardt, Dietrich,3,641,206.

Harlan, Martin L.; Davis, Jerry L.; and Nyland, Lloyd A., to Wolverine World Wide, Inc. Plate skinning machine. 3,640,325, Cl. 146-241.

Harnisch, Horst, to Farbenfabriken Bayer Aktiengesellschaft. Disazo dye salts. 3,640,994, Cl. 260-191.

Harowe Servo Controls Inc.: *See*—
Livingston, Douglas J., 3,641,376.

Harr, Stephen J., to Texaco Inc. Dual purpose lubricating compositions. 3,640,858, Cl. 252-49.8

Harris, John L., to Deltrol Corporation. Refrigeration system with delay timing mechanism. 3,640,085, Cl. 62-158.

Harrison, Bobby G.; and Esche, Charles D., to Whirlpool Corporation. Frost anticipating bimetal control for an air conditioner. 3,640,087, Cl. 62-227.

Harrison, Ian T.: *See*—
Fried, John H.; and Harrison, Ian T.,3,641,161.

Harrison, Robert R. Airplane construction frame. 3,640,491, Cl. 244-117.

Harschel, Jonas C. Resealing closure for cans and the like. 3,640,422, Cl. 220-24.5

Harst, Heinz: *See*—
Stephan, Gerhard; Harst, Heinz; Laux, Gunter; and Kappes, Alfred,3,640,799.

Hart, Bernard Eaton, to Flexian Hydraulics Ltd. Diaphragm pump. 3,640,647, Cl. 417-389.

Harte, Robert B., to Buhr Machine Tool Company. Circuit for and method of multiplexing for monitoring a plurality of separate machine tools. 3,641,326, Cl. 235-151.11

Hartley, Irby Ennis, Jr., to Du Pont de Nemours, E. I., and Company. Apparatus. 3,640,058, Cl. 57-34.

Hartman, John H., to Thermalloy Incorporated. Printed circuit card rack. 3,640,399, Cl. 211-175.

Hartz Mountain Pet Foods, Inc.: *See*—
Waki, Isamu, 3,640,497.

Haselrig, William E. Shoe construction. 3,640,004, Cl. 36-15.

Hashiguchi, Yasuhisa; and Kamada, Sueo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for production of adiponitrole. 3,641,105, Cl. 260-465.8

Hata, Kiyoshi, to Fumai Electric Company, Limited. Cassette tape device. 3,640,479, Cl. 242-45.19

Hatano, Isao; Kitajima, Kenichi; and Iwatani, Katsumi, to Omron Tateisi Electronics Co. Microprogrammed digital computer providing various operations by word circulation. 3,641,330, Cl. 235-159.

Hauser, Raimund: *See*—
Keznickl, Eduard, 3,640,441.

Havlas, Jiri: *See*—
Sedlarik, Jargslav; Havlas, Jiri; and Kostelecky, Premysl,3,640,440.

Hawker Siddely Dynamics Limited: *See*—
Yarnell, John, 3,640,604.

Hay, Russell G.: *See*—
Fernald, Herbert B.; Gall, William; and Hay, Russell G.,3,641,191.

Hay, Russell G.; McNulty, John G.; and Walsh, William L., to Gulf Research & Development Company. Process for converting trialkyl aluminums to aluminum alkoxides. 3,641,086, Cl. 260-448.

Hayashi, Chusaku, to Hayashi Seisakusha Co., Ltd. Motor control circuit for pad holder. 3,641,412, Cl. 318-470.

Hayashi, Jun: *See*—
Nagae, Tadashi; Oishi, Yasushi; and Hayashi, Jun,3,640,716.

Hayashi Seisakusha Co., Ltd.: *See*—
Hayashi, Chusaku, 3,641,412.

Hayden, Percy: *See*—
Clark, Duncan; and Hayden, Percy,3,641,162.

Hayes, Barry James: *See*—
Ball, Alan; Hayes, Barry James; and Matthews, Albert John,3,641,195.

Hayes, Charles F.; and Steffey, David R., to General Motors Corporation. Constant-area vectoring nozzle. 3,640,469, Cl. 239-265.35

Hayes, Harold B.; and Huff, Gerald L., to Lilly, Eli, and Company. Process for preparing 7-amino cephalosporamic acid. 3,641,018, Cl. 260-243.

Hayman, David Frank; and Wild, Anthony Musgrave, to B.D.H. Chemicals Limited. Substituted amides of 4-aryl-3-hydroxy butyric acids. 3,641,123, Cl. 260-500.5

Hayward Manufacturing Company, Inc.: *See*—
Erlich, Giora, 3,640,310.

Hazeltine Corporation: *See*—
Loughlin, Bernard D., 3,641,259.

Hazeltine Research, Inc.: *See*—
Verga, John, 3,640,124.
Wallingford, Clarence Robert, 3,641,369.

Heald Machine Company, The: *See*—
Hahn, Robert S.; and Keefe, Thomas R., 3,640,138.

Heartz, Robert Alan, to General Electric Company. Changeable address display device. 3,641,531, Cl. 340-184.

Heatcraft, Inc.: *See*—
Ammerman, George Edward; and McFarlane, William, 3,641,312.

Hedin, Robert A., to Phinizy, R. B., mesne. Keys for electronic security apparatus. 3,641,498, Cl. 340-164.

Heer, Alfred; and Metzger, Karl, to Ciba Limited. Polyglycidyl esters. 3,641,064, Cl. 260-348.

Hees, Walter: *See*—
Walz, Klaus; Hees, Walter; and Quaedvlieg, Mathieu,3,640,677.

Hegar, Gert, to Ciba Limited. Bisik azo dyestuffs containing an N-icyl imino-N-' pyridinium lower alkyleneaminophenyl group. 3,640,993, Cl. 260-146.

Hegedus, Balthasar; and Zeller, Paul, to Hoffmann-La Roche Inc. Preparation of phenylalanine derivatives and novel intermediates. 3,641,097, Cl. 260-456.

Heid, Christian: *See*—
Frind, Horst; Heid, Christian; and Aman, Horst,3,640,803.

Heileman, Richard C.: *See*—
Lutz, Leland H.; Heileman, Richard C.; Upstone, Harlan R.; Leonard, John M.; and Ottow, Melvin A.,3,639,950.

Heilman, William J., to Gulf Research & Development Company. Acid resistant polyester resins. 3,641,201, Cl. 260-867.

Heimbigner, Gary Lee, to North American Rockwell Corporation. Multiple phase clock signal generator using frequency related and phase separated signals. 3,641,370, Cl. 307-269.

Heindrich, Gunter: *See*—
Waschk, Fritz; Muller, Jurgen; Krieger, Heinrich; and Heindrich, Gunter,3,640,205.

Heine, John C.: *See*—
Allen, Clayton H.; and Heine, John C.,3,640,539.

Heinz, Walter E.: *See*—
McAndrew, France B.; Polly, George W.; and Heinz, Walter E.,3,641,192.

Helle, Gordon W., to Sawmill Hydraulics, Inc. Apparatus for splitting and chopping timber. 3,640,323, Cl. 144-193.

Heller, Martin G.; and Kelly, Donald D. Apparatus for processing transistor leads. 3,640,113, Cl. 72-332.
Heller, Rudolf. Method of producing shaped bodies of low specific gravity. 3,640,787, Cl. 156-77.
Hellman, Erik, to Allmanna Svenska Elektrisha Aktiebolaget. Mandrel for use in manufacturing a hollow elongated thin-walled metallic body and method of using such mandrel. 3,640,116, Cl. 72-476.
Henderson, John Frederick: *See*—
La Flair, Ronald Turner; and Henderson, John Frederick,3,641,205.
Hendrich, John H. Decking system. 3,640,191, Cl. 94-13.
Hendry, C. J., Company: *See*—
Becraft, Donald E., 3,640,400.
Hendry, Donald H.: *See*—
Johnson, Bruce K.; and Hendry, Donald H.,3,640,194.
Henkel & Cie GmbH: *See*—
Gotte, Ernst, 3,640,883.
Henle, Robert A.: *See*—
Castrucci, Paul P.; Gates, Harlan R.; Henle, Robert A.; Pricer, Wilbur David; Morton, Robert M.; Mason, John W.; and North, William D.,3,641,516.
Hennebert, Jacques: *See*—
Ferton, Jean-Yves; Hennebert, Jacques; and Strippoli, Francois,3,641,295.
Hennig, Hans Joachim; and Fischer, Peter, to Farbenfabriken Bayer Aktiengesellschaft. Process for the preparation of polyisocyanates which contain a carbodiimide-isocyanate adduct. 3,640,966, Cl. 260-77.5
Henrie, Thomas A.: *See*—
Scheiner, Bernard J.; Lindstrom, Ronald E.; and Henrie, Thomas A.,3,639,925.
Henry, Charles Frederick, to McCulloch Corporation. Multiple segment centrifugal clutch. 3,640,365, Cl. 192-105.
Henry, Clemence J.: *See*—
Wiley, Morris A.; Lacoste, Roger G.; Henry, Clemence J.; and Waldbillig, James O.,3,640,872.
Henry, Patrick M., to Hercules Incorporated. Isocyanate synthesis from amines and carbon monoxide catalyzed by PDC l_2. 3,641,092, Cl. 260-453.
Henry, William Nelson: *See*—
Alleman, Raymond Arthur; and Henry, William Nelson,3,640,792.
Henson, Glen E.; and Fisher, Milton W., said Fisher assor. to said Henson. Exercise apparatus. 3,640,530, Cl. 272-83.
Hepfer, Ivan C., to Furniture City Manufacturing Corporation. Method of making metal plates plastic articles. 3,640,789, Cl. 156-92.
Hepworth, Paul: *See*—
Foster, Richard Gregory; Joy, David Richard; Hepworth, Paul; and Dart, Edward Charles,3,641,173.
Hercules Incorporated: *See*—
Breslow, David S., 3,640,974.
Carpenter, Charles W., 3,640,786.
Chien, James C. W.; and Schwarz, Robert J., 3,640,946.
Graham, Donald P., 3,640,222.
Hamilton, John F.; and Pederson, Donald J., 3,640,585.
Henry, Patrick M., 3,641,092.
Koll, Laurel A., 3,640,461.
Kruse, Walter M., 3,641,067.
Vandenberg, Edwin J., 3,640,908.
Hermann, Allen M.: *See*—
Rembaum, Alan; and Hermann, Allen M.,3,641,470.
Hermann, Divid Trimble; and Remley, Kenneth Herald, to American Cyanamid Company. Textile adhesive from polyurethane containing carboxylate groups. 3,640,924, Cl. 260-13.
Herndon, John W., to United States of America, Navy. Electronic raster rotation system for television. 3,641,260, Cl. 178-7.7
Herold, Wolf; and Ohnsorge, Horst, to Telefunken Patentverwertungsgesellschaft m.b.H. Multiple data transmission system with variable bandwidth allocation among the transmitting stations. 3,641,273, Cl. 179-15.
Heron, James, to Pre-Load Company Inc., The. Concrete structures. 3,640,038, Cl. 52-224.
Hertz, Elisabeth: *See*—
Freed, Meier E.; and Hertz, Elisabeth,3,641,030.
Heusinkveld, Merlyn R., to Procter & Gamble Company, The. Coffee brewing packet. 3,640,727, Cl. 99-77.1
Hewlett-Packard Company: *See*—
Osborne, Thomas E., 3,641,328.
Heye, Hermann: *See*—
Sendt, Alfred, 3,640,517.
Heyer, Willy: *See*—
Rassmann, Christoph; and Heyer, Willy,3,640,581.
Heyn, William O.: *See*—
Mowat, Keith B.; and Heyn, William O.,3,640,542.
Hi-Speed Checkweigher Co., Inc.: *See*—
Del Rosso, Victor, 3,640,384.
Hicks, James C.: *See*—
Hicks, Margaret L., 3,640,465.
Hicks, Margaret L., to Hicks, James C. Quick-connect hose members and control system. 3,640,465, Cl. 239-583.
Hickson, Donald A.: *See*—
Csicsery, Sigmund M.; Hickson, Donald A.; and Jaffe, Joseph,3,640,904.
Hidaka, Mijio: *See*—
Yamada, Keisho; Nagai, Shigeki; Odan, Kyoji; Nakamura, Yasuo; and Hidaka, Mijio,3,641,100.
Hidaka, Mikio: *See*—
Yamada, Keisho; Nagai, Shigeki; Odan, Kyoji; Arima, Yasutaka; and Hidaka, Mikio,3,641,101.
Higgins, Francis J., to Courtaulds Limited. Tube furnace. 3,641,249, Cl. 13-22.
Hildebrandt, Peter; and Ruckdeschel, Walter, to Linde Aktiengesellschaft. Apparatus for the ignition of direct-current welding and cutting arcs. 3,641,311, Cl. 219-135.
Hilfman, Lee, to Universal Oil Products Company. Hydrocarbon conversion catalyst and method of manufacture. 3,640,903, Cl. 252-451.
Hinsch, James E.: *See*—
Fellers, John F.; Hinsch, James E.; and McLaughlin, Ernest O.,3,641,210.
Hintenberger, Karl. Vacuum furnace. 3,641,250, Cl. 13-31.
Hintringer, Otmar; Koniger, Walter; and Thorn, Jurgen, to Siemens Aktiengesellschaft. Laser device for controlled guidance of fabricating machine. 3,641,351, Cl. 250-203.
Hinz, Harry C., Jr.: *See*—
Bailey, David L.; and Hinz, Harry C., Jr.,3,641,526.
Hirata, Kinya: *See*—
Maeda, Yutaka; and Hirata, Kinya,3,641,409.
Hirohashi, Toshiyuki: *See*—
Yamamoto, Hisao; Kitagawa, Sumio; Inaba, Shigeho; Sakai, Shigeru; Hirohashi, Toshiyuki; Maruyama, Isamu; Akatsu, Mitsuhiro; and Izumi, Takahiro,3,641,002.
Hirose, Kengo; Ishiwata, Noboru; and Hukawa, Tadaomi, to Toyo Denki Seizo Kabushiki Kaisha. Vacuum switch assembly. 3,641,394, Cl. 317-27.
Hirota, Eiichi: *See*—
Kawamata, Tadashi; Hirota, Eiichi; Mihara, Toshihiro; and Terada, Yukio,3,640,871.
Hitachi, Ltd.: *See*—
Iimura, Tsutomu; Kurokawa, Susumu; and Emoto, Masayuki, 3,640,867.
Hobson, H. M., Limited: *See*—
Neal, Francis John; Courtenay, Jerzy Leon; and Simmons, John Richard, 3,640,092.
Hodan, James J.: *See*—
Dever, James L.; and Hodan, James J.,3,641,225.
Hodder, Wayne K., to Bell & Howell Company. Time-modulating apparatus. 3,641,468, Cl. 332-9.
Hodge Distributors Pty. Ltd.: *See*—
Hodge, George Alwyn, 3,640,566.
Hodge, George Alwyn, to Hodge Investments Pty. Ltd., and Hodge Distributors Pty. Ltd. Invalid chair. 3,640,566, Cl. 297-68.
Hodge Investments Pty. Ltd.: *See*—
Hodge, George Alwyn, 3,640,566.
Hodges, James R.: *See*—
Trifunoxic, Alexander L.; Hodges, James R.; and Shick, Richard L.,3,641,234.
Hodges, Robert James, to International Standard Electric Corporation. Apparatus for displaying and printing information. 3,641,585, Cl. 346-74.
Hodgins, Patrick M.: *See*—
Carter, William R.; Slaybaugh, Charles Jay; and Hodgins, Patrick M.,3,640,420.
Hodkin, Richard Keith: *See*—
Milner, Peter James; and Hodkin, Richard Keith,3,640,587.
Hoffman, Emil De Coudres, to Westinghouse Electric Corporation. Metering system having a remote register. 3,641,537, Cl. 340-205.
Hoffman-La Roche Inc.: *See*—
Beaman, Alden Gamaliel; Duschinsky, Robert; and Tautz, William Paul, 3,641,047.
Hoffmann, Heiner, to Ingeborg Niess Elektromedizinische Apparate. Electric contactor with venturi-suction means for organic tissue. 3,640,270, Cl. 128-2.1
Hoffmann, Hellmut; and Scheinpflug, Hans, to Farbenfabriken Bayer Aktiengesellschaft. Bromoalkyl-(D1)-thiolphosphoric acid esters. 3,641,224, Cl. 260-964.
Hoffmann-La Roche Inc.: *See*—
Hegedus, Balthasar; and Zeller, Paul, 3,641,097.
Kyburz, Emilio; and Spiegelberg, Hans, 3,641,153.
Pawson, Beverly Ann; and Saucy, Gabriel, 3,641,156.
Hofmann, Gunter A. G.: *See*—
Lund, Roger E.; and Hofmann, Gunter A. G.,3,641,384.
Hogan, Walter J.: *See*—
Cook, William C.; and Hogan, Walter J.,3,641,558.
Hogan, Walter J.; and Malden, Ancile E., to International Business Machines Corporation. Staggered video digital TV system. 3,641,559, Cl. 340-324.
Hogstrom, Edwin F.; Stumphauzer, William C.; and Nord, Eric T., to Nordson Corporation. Method for coating the interiors of hollow bodies. 3,640,758, Cl. 117-96.
Holecek, Milan, to Projektovy ustav dopravnich a inzenyrskych staveb. Method and arrangement for registering and recording of deformations of materials. 3,641,581, Cl. 346-1.
Holland Hitch Company: *See*—
Neff, Charles G.; and Carrier, Louis V., 3,640,549.

Holland, William Dean; Schmitt, Joseph Michael; and Griffith, Richard McDonald, to American Cyanamid Company. Polymer compositions and method for the production thereof. 3,641,197, Cl. 260-854.

Hollingsead, Robert A.; Kuchler, Abraham; and Pryor, Clyde Robert, to Hollingsead-Pryor Enterprises, Inc. Extractor hold down apparatus. 3,640,141, Cl. 74-89.15

Hollingsead-Pryor Enterprises, Inc.: *See*—
Hollingsead, Robert A.; Kuchler, Abraham; and Pryor, Clyde Robert, 3,640,141.

Hollingsworth, Gale C.; and Steffel, Ronald V., to Motorola, Inc. Amplifier protection circuit. 3,641,451, Cl. 330-134.

Hollister Incorporated: *See*—
Etes, Donald E., 3,640,741.

Holm, William J., to Riggs & Lombard, Inc. Apparatus for continuously scouring webs of knit material or the like. 3,640,099, Cl. 68-19.1

Holman, Donald John, to Berk Limited. Preparation of brominated silane derivatives. 3,641,087, Cl. 260-448.8

Holme, John: *See*—
Rolland, Jacques R.; and Holme, John,3,640,730.

Holotron Corporation: *See*—
Neeley, Victor I.; and Libby, Hugo L., 3,640,598.

Holscher, Donald J.: *See*—
Chaplin, Richard W.; Holscher, Donald J.; Wasney, Albert Jr.; and Wheeler, Bryce A.,3,641,261.

Holsinger, Jerry L., to Intertel, Inc. Frequency shift transmitter. 3,641,460, Cl. 331-110.

Holzl, Robert A.: *See*—
Glaski, Frederick A.; Holzl, Robert A.; and Kaplan, Richard B.,3,640,689.

Homeyer, Bernhard: *See*—
Schlor, Hanshelmut; Hammann, Ingeborg; and Homeyer, Bernhard,3,641,223.

Honey, Alfred John: *See*—
Britt, Jack; and Honey, Alfred John,3,640,638.

Honeywell Inc.: *See*—
Kreidermacher, Leonard L.; and Hudson, David M., 3,641,331.
Schoenwitz, Frank H. W., 3,641,530.

Hoogendoorn, Helen M.; Liberman, Herbert E.; Narken, Bernt; and Sunners, Brian, to International Business Machines Corporation. Method of mounting a ferrite head. 3,639,976, Cl. 29-603.

Hooker Chemical Corporation: *See*—
Dever, James L.; and Hodan, James J., 3,641,225.

Hoover Ball and Bearing Company: *See*—
Rupert, Samuel J.; and Ziegler, William E., 3,640,667.

Hop, Adrianus G., to Shell Oil Company. Liquid level meter. 3,640,134, Cl. 73-299.

Hopkins, Neil E.; and Muench, Paul W., to Borg-Warner Corporation. Refrigeration system and method. 3,640,084, Cl. 62-101.

Horiguchi, Shojiro; and Nakamura, Michiei. Method of making coupler-bonded-polymers and chromogen-bonded-polymers, and polymers made thereby. 3,640,983, Cl. 260-89.7

Horikawa, Hideichi: *See*—
Katayama, Shitomi; and Horikawa, Hideichi,3,640,971.

Hornschuch, Hanns; and Alderson, William T., to Ingersoll-Rand Company. Air compressor system. 3,640,646, Cl. 417-203.

Horrom, Bruce W.; Crovetti, Aldo J.; and Viste, Kenneth L., to Rohm and Haas Company. 3,5-Disubstituted benzamides. 3,640,699, Cl. 71-118.

Horsley, Geoffrey Winton; and Burnett, Ronald Cyril, to United Kingdom Atomic Energy Authority. Manufacture of ceramic artefacts having pores. 3,641,227, Cl. 264-0.5

Horton, John W., to International Business Machines Corporation. Blood flow pressure measurement technique employing injected bubbles and ultrasonic frequency scanning. 3,640,271, Cl. 128-2.05

Hoshi, Hiroshi: *See*—
Susuki, Rinnosuke; Hoshi, Hiroshi; and Araki, Shinichi,3,640,470.

Hottinger, Conrad C., to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Firing button for releasing a trigger and opening a cartridge ejection gate. 3,640,177, Cl. 89-33.

Houdaille Industries, Inc.: *See*—
McLean, Ronald L., 3,640,149.

Hougen, Kenneth O. Vacuum actuated automatic transfer device. 3,640,319, Cl. 141-42.

House, Bruce F., to Shelley Manufacturing Company. Plural stack dispenser having common actuation for stacks. 3,640,427, Cl. 221-127.

Housman, William A. Card and verification system having card voiding element. 3,641,499, Cl. 340-149.

Howald, Frank Peterson: *See*—
Gieseke, Elmer William; and Howald, Frank Peterson,3,640,862.

Howe, Ralph S., Jr., to Textron, Inc. Antifriction bearing with embedded race inserts. 3,640,592, Cl. 308-193.

Howell, John B.: *See*—
Yates, Lester R.; Dorsey, Charles M., Jr.; Howell, John B.; Conklin, Winfred S.; Sawicki, Joseph J.; Shepherd, Reeves T.; and Soares, Silvio,3,641,434.

Howland, Robin, to Parker-Knoll Limited. Drop-end seat mechanism. 3,640,567, Cl. 297-116.

Howman, Eric James: *See*—
Turner, Leonard; Howman, Eric James; and Bradshaw, Christopher Patrick Cadman,3,641,189.

Howmet Corporation: *See*—
Schwartz, Charles W.; and Martini, Richard W., 3,640,815.

Hoyt, Hazen L., III: *See*—
Jeromin, Lothar S.; and Hoyt, Hazen L., III,3,640,246.

Hrdina, Jiri, to Ceskoslovenska akademie ved. Method and an apparatus for separating a segmentation medium from a stream of a segmented main fluid. 3,640,822, Cl. 210-65.

Hrubecky, Frederick J., to Kimberly-Clark Corporation. Disposable garment and method and apparatus for making same. 3,639,915, Cl. 2-114.

Hruby, John O., Jr., to Rain Jet Corporation. Liquid discharge nozzle having improved flow control means. 3,640,472, Cl. 239-552.

Hsia, Shwang, to Frye Industries, Inc., mesne. Process of making toner. 3,640,861, Cl. 252-62.1

Huber & Co.: *See*—
Westerkamp, Hugo; and Dubois, Robert, 3,641,284.

Huber, Hans-Peter, to Agfa-Gevaert Aktiengesellschaft. Control arrangement for copying apparatus. 3,640,619, Cl. 355-36.

Huckstadt, Harald; Saleck, Wilhelm; Randolph, August; Moll, Franz, and Ranz, Erwin, to Agfa-Gevaert Aktiengesellschaft. Photographic silver halide emulsion containing as a sensitizer bis-quarternary salts of bis- aminoalkyl-disulfides. 3,640,715, Cl. 96-55.

Huddle, Carl F., to Tension Structures Co. Pavilion with mechanism for automatically controlling sag and tension. 3,640,296, Cl. 135-4.

Hudson, David M.: *See*—
Kreidermacher, Leonard L.; and Hudson, David M.,3,641,331.

Huebner, Charles Ferdinand, to Ciba Corporation. Trimeric hydrocarbon. 3,641,179, Cl. 260-668.

Huet, Yves: *See*—
Pourrias, Bernard; Huet, Yves; and Pomaret, Carlos,3,641,124.

Huff, Gerald L.: *See*—
Hayes, Harold B.; and Huff, Gerald L.,3,641,018.

Huffman, Jerry P.: *See*—
Auer, John H., Jr.; and Huffman, Jerry P.,3,641,575.

Huffman, William W., to Marketers, Inc. Portable food and drink carrier. 3,640,380, Cl. 206-4.

Hughes Aircraft Company: *See*—
Boucher, Robert J., 3,641,442.
Chaplin, Richard W.; Holscher, Donald J.; Wasney, Albert Jr.; and Wheeler, Bryce A., 3,641,261.
Dehne, Axel G., 3,640,082.
Field, Lester M.; Walker, Richard A.; and McKee, William E., 3,640,712.
Grant, Jon H.; and Bales, Walter D., 3,641,365.
Jamba, Douglas M.; and Ennis, Robert M., Jr., 3,641,341.
Jones, Sheldon, 3,640,628.
Lian, Kenneth T.; and Long, Willis F., 3,641,358.
Lund, Roger E.; and Hofmann, Gunter A. G., 3,641,384.
Oakes, Malcolm M., 3,641,306.
Stults, Richard L.; and Curry, Robert W., 3,641,266.
Taylor, Elmer N., 3,641,257.

Hughes, Nigel: *See*—
Berrie, Alistair Howard; and Hughes, Nigel,3,640,674.

Hughes, Philip G., to General Electric Company. Switching device for electromagnetic motor starters. 3,641,287, Cl. 200-16.

Hughes, Roland O.; and Allen, Joseph H., to North American Rockwell Corporation. Speed altitude command system for aerial vehicles. 3,641,323, Cl. 235-150.2

Hukawa, Tadaomi: *See*—
Hirose, Kengo; Ishiwata, Noboru; and Hukawa, Tadaomi,3,641,394.

Hullinger, Clifford H.; Cohen, Lawrence; and Yui, Nooyuki Henry, to American Maize-Products Company. Process for making paper using starch having an increased gel strength. 3,640,842, Cl. 162-175.

Humphriss, Wesley D.; and Bartlett, Lawrence C., to Eastman Kodak Company. Barrier layers for electrophotographic elements containing a blend of cellulose nitrate with a tetrapolymer having vinylidene chloride as the major constituent. 3,640,708, Cl. 96-1.5

Hunhoff, Raymond: *See*—
Primus, Norman S.; and Hunhoff, Raymond,3,640,759.

Hunsicker, Paul Robert, to Commercial Mechanisms, Inc. Trajectory control mechanism for ball pitching machine. 3,640,262, Cl. 124-7.

Hunter Douglas International Ltd.: *See*—
Rijnders, Willem, 3,640,033.

Hunter, Neville John: *See*—
Forbes, Alan David; and Hunter, Neville John,3,640,893.

Hurst, James J.: *See*—
Robertshaw, Fred C.; Bartos, Jon .; Hurst, James J.; and McGurty, James August,3,640,704.

Hurtig, Carl R., to Damon Corporation. Liquid container having pressure-protected dialyzing membrane. 3,640,393, Cl. 210-321.

Hurtig, Carl R.; Ferrari, Andres; and Khoury, Amin J., to Damon Corporation. Clinical sample container. 3,640,267, Cl. 128-2.

Hussey, Joseph L., to Bonin, Pete J. Therapy table. 3,640,272, Cl. 128-33.

Hutley, Ronald W. F., to Advanced Terminals, Inc. Apparatus for stacking fan folded paper. 3,640,521, Cl. 270-61.

Huxley, Edward E.: *See*—
Warner, Paul F.; and Huxley, Edward E.,3,640,736.

Hydroconic Limited: *See*—
Corlett, Ewan Christian Brew, 3,640,071.

Hymes, Alan C.; Margulis, Rajko R.; and Nalbandian, Robert M., to Wyandotte Chemicals Corporation, mesne. Method for the treatment of an embolus or thrombus. 3,641,240, Cl. 424-78.

Hyodo, Masayoshi: *See*—
Suzuki, Masaru; and Hyodo, Masayoshi,3,641,493.

Ibbett, Roland Norman; and Aspinall, David, to National Research Development Corporation. Multiplex spectrometer. 3,640,625, Cl. 356-97.

Ichikawa, Takehiko: *See*—
Ito, Tomiyasu,; Nagata, Koichiro; Ichikawa, Takehiko; and Kato, Tetsuya,3,641,003.

Ichikawa, Yataro; and Yamanaka, Yoshiyuki, to Teijin Limited. Process for the preparation of bis-(β- hydroxyalkyl)esters of aromatic dicarboxylic acids. 3,641,112, Cl. 260-475.

Ichimaru, Takarokuro: *See*—
Arimura, Tohru; Kamata, Masamoto; Okado, Masaru; and Ichimaru, Takarokuro,3,641,325.

Ichimura, Hiroshisa: *See*—
Mori, Yoichi; and Ichimura, Hiroshisa,3,640,156.

Ichise, Noboru. Combination leg/foot rest and bed cover retainer. 3,639,929, Cl. 5-327.

Ideal Basic Industries, Inc.: *See*—
Smith, Randal E.; and Egbom, Clarence W., 3,640,385.

Iimura, Tsutomu; Kurokawa, Susumu; and Emoto, Masayuki, to Hitachi, Ltd. Lithium-zinc ferrite composition with arsenic oxide or bismuth oxide. 3,640,867, Cl. 252-62.61

Ikeda, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Microwave oven. 3,641,301, Cl. 219-10.55

Ilnyckyj, Stephan; Cole, John Charles O.; Feldman, Nicholas; and Strickland, Barney R., to Esso Research and Engineering Company. Enhancing low temperature flow properties of fuel oil. 3,640,691, Cl. 44-52.

Impastato, Leona Rocha. Instrument for altering garment patterns. 3,639,988, Cl. 33-11.

Imperial Chemical Industries Limited: *See*—
Berrie, Alistair Howard; and Hughes, Nigel, 3,640,674.
Bishop, Nigel Douglas; and Masters, Joan Irene, 3,641,035.
Brooks, Martin Frederick; and Kerrigan, Vincent, 3,641,093.
Clark, Duncan; and Hayden, Percy, 3,641,162.
Cornforth, David Arthur; Waddan, Dhafir Yusuf; and Williams, Derek, 3,641,106.
Foster, Richard Gregory; Joy, David Richard; Hepworth, Paul; and Dart, Edward Charles, 3,641,173.
Jackson, John Ernest, 3,640,948.

Impola, Clarence N.: *See*—
McKillip, William J.; Culbertson, Billy M.; and Impola, Clarence N.,3,640,676.

Inaba, Shigeho: *See*—
Yamamoto, Hisao; Kitagawa, Sumio; Inaba, Shigeho; Sakai, Shigeru; Hirohashi, Toshiyuki; Maruyama, Isamu; Akatsu, Mitsuhiro; and Izumi, Takahiro,3,641,002.

Inagaki, Tsuguya: *See*—
Tomiyasu, Hiroshi; Inagaki, Tsuguya; Kajiura, Hiroshi; and Watanabe, Kinnosuke,3,640,135.

Inamoto, Toshiharu: *See*—
Osugi, Kinichiro; Suzuki, Yoshiaki; Mori, Tokio; and Inamoto, Toshiharu,3,641,561.

Inamura, Seiichi; Kondo, Yusuke; Akita, Minoru; and Chikanari, Kenichi, to Toyo Boseki Kabushiki Kaisha. Apparatus for continuous reaction of high viscous materials. 3,640,509, Cl. 259-104.

Industrial Nucleonics Corporation: *See*—
Fleming, John W., *Jr.*; and McMullen, James Michael, 3,640,162.

Ingeborg Niess Elektromedizinische Apparate: *See*—
Hoffmann, Heiner, 3,640,270.

Ingersoll-Rand Company: *See*—
Hornschuch, Hanns; and Alderson, William T., 3,640,646.

Ingram, Brian, to Girling Limited. Two pedal hydraulic braking system. 3,640,067, Cl. 60-54.6

Inoue, Hidemu: *See*—
Ito, Hiroo; Nakamura, Seiichi; and Inoue, Hidemu,3,640,902.

Inoue, Kiyoshi. Shock forming. 3,640,110, Cl. 72-56.

Inoue, Masahiko; and Tojyo, Ken, to Toyota Jidosha Kogyo Kabushiki Kaisha, and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Safety belt buckle. 3,639,951, Cl. 24-230.

Institut Francais du Petrole des Carburants et Lubrifiants: *See*—
Phung, Nhu Hung; and Le Febvre, Gilles, 3,640,987.
Rouchaud, Jean; and Seree De Roch, 3,641,066.

Institut fur Silikon-und Fluorkarbon-Chemie: *See*—
Muller, Richard; Frey, Hans; and Dathe, Christian, 3,641,082.

Institute of Gas Technology: *See*—
Lee, Bernard Shing-Shu; and Schora, Frank C., *Jr.*, 3,640,016.

Institutul de Cercetari Si Proiectari Alimentare: *See*—
Moisescu, Gheorghe; Stoica, Valer; Wolf, Carol; and Spataru, Nicolae, 3,640,206.

Integrated Building Industry, Inc.: *See*—
Collins, Howard W., 3,641,303.

Intelligent Instruments, Inc.: *See*—
Slavin, Peter E., 3,641,554.

International Assembly Corporation: *See*—
Friberg, Nelson A., 3,641,552.

International Business Machines Corporation: *See*—
Bailey, David L.; and Hinz, Harry C., *Jr.*, 3,641,526.
Burns, Gerald; Giess, Edward A.; and O'Kane, Daniel F., 3,640,865.
Castrucci, Paul P.; Gates, Harlan R.; Henle, Robert A.; Pricer, Wilbur David; Morton, Robert M.; Mason, John W.; and North, William D., 3,641,516.
Champ, Robert B.; Jurgens, Henry A.; and Thompson, James O., 3,640,714.
Cook, William C.; and Hogan, Walter J., 3,641,558.
Detweiler, John R., *Jr.*; and Tummala, Rao R., 3,640,738.
Drejza, John E., 3,640,217.
Greanias, Evon C.; and Levine, Wilbur J., 3,641,500.
Griffing, Brandt M., 3,641,367.
Hogan, Walter J.; and Malden, Ancile E., 3,641,559.
Hoogendoorn, Helen M.; Liberman, Herbert E.; Narken, Bernt; and Sunners, Brian, 3,639,976.
Horton, John W., 3,640,271.
Irwin, John W., 3,641,534.
Jones, Richard A., 3,641,556.
Revitz, Martin; and Turene, Francis E., 3,641,402.
Yao, Ying L., 3,641,360.

International Computers Limited: *See*—
Whitehead, Cecil Thomas; and Critchley, Anthony Francis Ewart, 3,641,502.

International Controls Corporation: *See*—
Shmueli, Kalman; Scott, Robert T.; and Mills, Wallace R., 3,640,318.

International Harvester Company: *See*—
Fueslein, Jerome L., 3,640,346.

International Lead Zinc Research Organization, Inc.: *See*—
Overmars, Henricus Gerardus Josef; Van Elven, Aris; and Noltes, Jan Gerrit, 3,641,178.
Radtke, Schrade F., 3,641,080.
Radtke, Schrade F., 3,641,081.

International Minerals & Chemical Corporation: *See*—
Lang, William J.; and Krajewski, John J., 3,640,826.

International Nickel Company, The: *See*—
Taylor, Brian; and Parry, Philip James, 3,640,777.

International Paper Company: *See*—
Lee, Charles A.; and Sorrells, Frank D., 3,640,000.

International Standard Electric Corporation: *See*—
Fettweis, Alfred Leo Maria, 3,641,271.
Gaines, Brian R.; and Shemer, Raymond A., 3,641,447.
Hodges, Robert James, 3,641,585.
Perrault, Jean; and Salie, Adelin E. G., 3,641,494.

International Synthetic Rubber Company Limited, The: *See*—
Jenkins, Derek Keith; and Dixon, Christopher George Piers, 3,641,176.

International Telephone and Telegraph Corporation: *See*—
Albanese, Damian F., 3,641,573.
Canty, Eugene T., 3,641,438.
Green, Joseph A., 3,641,445.
Guark, Richard J.; and Reicher, Milton D., 3,641,437.
Lutz, Leland H.; Heileman, Richard C.; Upstone, Harlan R.; Leonard, John M.; and Ottow, Melvin A., 3,639,950.
Spanos, William M.; and Polgar, Michael S., 3,641,578.

Intertel, Inc.: *See*—
Holsinger, Jerry L., 3,641,460.

Irish, Carleton D.; and Painkin, Harold, to Bell Telephone Laboratories, Incorporated. Intercept connector for making alternative bridging connections having improved contact clip construction. 3,641,475, Cl. 339-17.

Irwin, John W., to International Business Machines Corporation. Intra-record resynchronization in digital recording systems. 3,641,534, Cl. 340-174.1

Isaacson, Henry V.: *See*—
Chambers, Robert R.; Isaacson, Henry V.; and Young, David W.,3,640,973.

Isbitsky, Bernard: *See*—
Chisholm, Daniel R.; Solomon, Jack M.; and Isbitsky, Bernard,3,641,022.

Ise Electronics Corporation: *See*—
Nakamura, Tadashi, 3,641,390.

Ishihara, Masao; Sugino, Osakazu; Nishina, Yoshio; Kohno, Isao; and Satoh, Yuzuru, to Konishiroku Photo Industry Co., Ltd. Gelatinous photographic coating composition. 3,640,721, Cl. 96-114.4

Ishiwata, Mamoru; and Akio, Huruya, to Fuji Shashin Film Kabushiki Kaisha. Coating method. 3,640,752, Cl. 117-47.

Ishiwata, Noboru: *See*—
Hirose, Kengo; Ishiwata, Noboru; and Hukawa, Tadaomi,3,641,394.

Ismail, Roshdy: *See*—
Termin, Eric; and Ismail, Roshdy,3,641,079.

ISO Nuclear Corporation: *See*—
Armel, Jack; Kogan, Mark; and Cohen, Howard S., 3,641,342.

Isobe, Hiroshi; Aoki, Hachiro; and Tanaka, Noritoshi, to Diesel Kiki Kabushiki Kaisha. Governor for internal combustion engines of injection type. 3,640,258, Cl. 123-140.

Isobe, Masahide, to Tokyo Sokuhan Co., Ltd. Rocking type apparatus provided with prism or mirrors in microscope for bonder. 3,640,600, Cl. 350-34.

Isler, Jorg: *See*—
Mittag, Hermann; and Isler, Jorg,3,640,260.

Itagaki, Kenichi, to Max Corporation. Stapler. 3,640,443, Cl. 227-120.

Itek Corporation: *See*—
Gallet, Jacques Henri; and Gracia, Robert Francis, 3,640,717.

Ito, Hiroo; Nakamura, Seiichi; and Inoue, Hidemu, to Tao Gosei Chemical Industry Co., Ltd. Catalyst for the vapor-phase oxidation of lower olefins and a process for preparing the same. 3,640,902, Cl. 252-439.

Ito, Osamu: *See*—
Sumiyoshi, Masaharu; Sakakibara, Shigeru; Ito, Osamu; and Kato, Takaaki,3,640,151.

Ito, Tomiyasu,; Nagata, Koichiro; Ichikawa, Takehiko; and Kato, Tetsuya, to Ajinomoto Co., Inc.Method of preparing an α-amino-γ-lactam. 3,641,003, Cl. 260-239.3

Ivers, Richard J.; and McDonough, William H., to Dynamics Research Corporation. Digital resolver. 3,641,565, Cl. 340-347.

Iwabuchi, Yoshitaka: *See*—
Kinjo, Hisao; Iwabuchi, Yoshitaka; Takashima, Seiichi; Kato, Takotoshi; and Okano, Keigo,3,641,278.

Iwata, Hiroo: *See*—
Kundo, Kishichiro; Iwata, Hiroo; Yamaguchi, Nario; Shimizu, Sakae; and Tubuko, Kazuo,3,640,709.

Iwatani, Katsumi: *See*—
Hatano, Isao; Kitajima, Kenichi; and Iwatani, Katsumi,3,641,330.

Izumi, Takahiro: *See*—
Yamamoto, Hisao; Kitagawa, Sumio; Inaba, Shigeho; Sakai, Shigeru; Hirohashi, Toshiyuki; Maruyama, Isamu; Akatsu, Mitsuhiro; and Izumi, Takahiro,3,641,002.

Jacaway, William Arthur, Jr.: *See*—
Armbruster, Frederick Carl; and Jacaway, William Arthur, Jr.,3,640,847.

Jackson, John Ernest, to Imperial Chemical Industries Limited. Stabilized polyamides. 3,640,948, Cl. 260-45.75

Jackson, Wilbur C.; and Beck, William P., to Sunbeam Corporation. Electric dry shaver with inclined shaving head. 3,639,984, Cl. 30-34.1

Jacobsen, Gunter: *See*—
Fernholz, Hans; and Jacobsen, Gunter,3,641,113.

Jacobus, Dwight W.; and Simms, Michael L., to General Electric Company. Household refrigerator including exterior ice service. 3,640,088, Cl. 62-320.

Jaeger, Karl. Vertical takeoff and landing aircraft. 3,640,489, Cl. 244-23.

Jaffe, Joseph: *See*—
Csicsery, Sigmund M.; Hickson, Donald A.; and Jaffe, Joseph,3,640,904.

Jaffe, Joseph; and Kittrell, James R., to Chevron Research Company. Thermactivation of catalysts comprising rhenium and crystalline zeolitic molecular sieve particles dispersed in a gel matrix, and catalysts so term- activated. 3,641,096, Cl. 252-455.

Jamba, Douglas M.; and Ennis, Robert M., Jr., to Hughes Aircraft Company. Ion beam image converter. 3,641,341, Cl. 250-49.5

James, Claire L., to Eastman Kodak Company. Control apparatus and method for a photographic device. 3,640,198, Cl. 95-13.

James, Edward Anthony: *See*—
Di Stefano, Ralph David; and James, Edward Anthony,3,640,765.

James, William G.: *See*—
Kekish, George T.; James, William G.; and Simons, Duane J.,3,640,933.

Jania, Zbigniew J., to Ford Motor Company. Hydraulic power supply. 3,640,301, Cl. 137-101.

Janoski, Edward J.: *See*—
Moore, Robert E.; and Janoski, Edward J.,3,641,167.

Januszewski, Joseph Paul; and Bahouth, Tayseer George, to Colgate-Palmolive Company. Stable dental cream composition. 3,641,238, Cl. 424-49.

Jauvtis, Harvey I., to United States of America, Air Force. Magnetic domain circulating shift register. 3,641,523, Cl. 340-174.

Javet, Alain, to Battelle Development Corporation, The. Heat exchangers. 3,640,330, Cl. 159-6.

Jefferson Chemical Company, Inc.: *See*—
Bentley, Floyd Edward; and Godfrey, Norman Bell, 3,639,928.

Jehle, Robert E.: *See*—
Petropoulas, Spyros K.; Jehle, Robert E.; and Halberstam, Mendel M.,3,641,350.

Jenkins, Derek Keith; and Dixon, Christopher George Piers, to International Synthetic Rubber Company Limited, The. Olefin oligomerisation process. 3,641,176, Cl. 260-668.

Jenkins, Peter J.; and Neller, William C., to Dunlop Holdings Limited. Conveyors systems. 3,640,371, Cl. 198-16.

Jenks, Herbert R., to Dura Fiber, Inc. Method for making prestressed laminated fiber-glass structures. 3,641,230, Cl. 264-152.

Jenner, Myron. Closure device for food-containing bags and the like. 3,639,947, Cl. 24-30.5

Jensen, Reilly C.: *See*—
Partridge, Jerry A.; and Jensen, Reilly C.,3,641,226.

Jepsen, Tag L. B., to Basic Incorporated. Flotation concentration of magnesite with emulsified collector reagents. 3,640,382, Cl. 209-12.

Jerabek, Robert D.: *See*—
Plasynski, Joseph E.; and Jerabek, Robert D.,3,640,810.

Jerchel, Dietrich: *See*—
Ost, Walter; Thomas, Klaus; Jerchel, Dietrich; and Linden, Gerbert,3,641,062.

Jernakoff, George: *See*—
Van der Grinten, Willem J.; and Jernakoff, George,3,641,340.

Jeromin, Lothar S.; and Hoyt, Hazen L., III, to Xerox Corporation. Development apparatus for latent electrostatic images. 3,640,246, Cl. 118-629.

Jobson, Roger J.: *See*—
Kipping, Vernon L., 3,641,334.

Johnson & Johnson: *See*—
Oelmann, Peter; and Weisshuhn, Peter, 3,640,522.

Johnson, Arthur F. Electrolytic cell. 3,640,800, Cl. 204-67.

Johnson, Bruce K.; and Hendry, Donald H., to Polaroid Corporation. Photographic apparatus for mounting a multi-lamp flash unit. 3,640,194, Cl. 95-11.

Johnson, Ernest W., to General Mills, Inc. Simulated cooked egg. 3,640,732, Cl. 99-114.

Johnson Gage Company, The: *See*—
Johnson, Lowell C.; and Johnson, Lowell C., 3,639,996.
Johnson, Lowell C.; and Johnson, Lowell C., 3,639,996.

Johnson, Glenn E., to United States of America, Interior. Production of methane by bacterial action. 3,640,846, Cl. 195-27.

Johnson, Harry T., to Battelle Development Corporation, The. Inner vane for rotary devices. 3,640,651, Cl. 418-269.

Johnson, Lowell C.; and Johnson, Lowell C., to Johnson Gage Company, The Johnson Gage Company, The. Screw thread gage with aligner Screw thread gage with aligner. 3,639,996, Cl. 33-199.

Johnson, Lowell C.: *See*—
Johnson, Lowell C.; and Johnson, Lowell C.,3,639,996.

Johnson, Matthey & Co. Limited: *See*—
Selman, Gordon Leslie; and Ellison, Peter James, 3,640,705.

Johnson, Morris A.; and Yang, Kang, to Continental Oil Company. Process for preparing 1,2-dichloroethane. 3,641,172, Cl. 260-658.

Johnson, Norman A.: *See*—
Gilbo, Charles F.; and Johnson, Norman A.,3,640,045.

Johnson, Roger L.: *See*—
Bitzer, Donald L.; Bandy, Lyle E.; Johnson, Roger L.; and Skaperdas, Dominic O.,3,641,529.

Johnson, S. C., & Son, Inc.: *See*—
Dill, Douglas W., 3,640,916.

Jones, David H.: *See*—
Shank, Richard C.; Zucker, Carl E.; Jones, David H.; Ribbq Harry F.q Jr.; and Bayard, Robert T.,3,640,844.

Jones, Edward S.: *See*—
Anello, Louis G.; Boghosian, Edward Michael; Jones, Edward S.; Minhas, Pritam S.; Price, Alson K.; and Sweeney, Richard F.,3,641,083.

Jones, Giffin D.; and Roth, Harold H., to Dow Chemical Company, The. Substituted acylated polyimine resins. 3,640,909, Cl. 260-2.

Jones, Lawrence Temple; Schmidt, Gerald W.; and Smith, Jay, III, to California R & D Center. Toy top utilizing a moving picture apparatus. 3,640,019, Cl. 46-49.

Jones, Richard A., to International Business Machines Corporation. Character addressing system. 3,641,556, Cl. 340-324.

Jones, Sheldon, to Hughes Aircraft Company. Electro-optical target acquisition blanking system. 3,640,628, Cl. 356-152.

Jope, Bruce T.; and Phillips, Alan R., to Monsanto Company. Trim in place thermoforming apparatus. 3,640,666, Cl. 425-302.

Jordan, Edward Graham: *See*—
Woodward, Jack Thomas Armon; and Jordan, Edward Graham,3,641,586.

Jordan, Manuel A.: *See*—
Gonzenbach, Carlos T.; and Jordan, Manuel A.,3,640,977.

Jorgensen, Kirsten Borre: *See*—
Reulet, Philippe; Pfister, Alain; Tellier, Jacques; Blanc, Jean-Henry; Jorgensen, Kirsten Borre; and Bohlbro, Hans,3,641,102.

Josey, Geoffrey Ernest. Internal combustion engines. 3,640,261, Cl. 123-188.

Joy, David Richard: *See*—
Foster, Richard Gregory; Joy, David Richard; Hepworth, Paul; and Dart, Edward Charles,3,641,173.

Jubb, Albert, to Rolls Royce Limited. Pressure vessels. 3,640,032, Cl. 52-2.

Juda, Walter; Allen, Robert J.; and Petrow, Henry G., to Prototech Co., division of Bolt Beranek and Newman Inc. Method of increasing fuel cell current density. 3,640,774, Cl. 136-86.

Jung, Richard, to L & C Steinmuller G.m.b.H. Register construction for closing off circular- cylindrical flow ducts. 3,640,499, Cl. 251-305.

Jung, Richard; and Lenkewitz, Horst, to L & C Steinmuller G.m.b.H. Apparatus for breaking up lumpy material. 3,640,475, Cl. 241-55.

Jurgens, Henry A.: *See*—
Champ, Robert B.; Jurgens, Henry A.; and Thompson, James O.,3,640,714.

Jursich, Myron J., and Ciesla, Stanley F., to Nalco Chemical Company. Electrophotographic recording member and process of producing the same. 3,640,766, Cl. 117-218.

Justus, Edgar J., to Beloit Corporation. Bearing support and drive for controlled crown roll. 3,639,956, Cl. 29-116.

Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*—
Bretting, Klaus, 3,641,482.

Kabel- und Metallwerke Gutehoffnungshutte Iktiengesehlschaft: *See*—
Klebel, Wolfram, 3,641,309.

Kabushiki Kaisha Koparu: *See*—
Okada, Takaaki, 3,641,545.

Kabushiki Kaisha Ricoh: *See*—
Ando, Sadanao, 3,640,424.
Kasuya, Kazuhiko; Ohta, Wasaburo; and Okuno, Zenjiro, 3,640,751.
Kundo, Kishichiro; Iwata, Hiroo; Yamaguchi, Nario; Shimizu, Sakae; and Tubuko, Kazuo, 3,640,709.
Okuno, Zenjiro; Mizuno, Akinori; and Kondoh, Ikuyo, 3,640,863.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Inoue, Masahiko; and Tojyo, Ken, 3,639,951.
Suzuki, Masaru; and Hyodo, Masayoshi, 3,641,493.

Kaeser, Ernst K.: *See*—
Ringland, William L.; and Kaeser, Ernst K.,3,641,467.

Kaiser Aluminum & Chemical Corporation: *See*—
Finnegan, Walter D., 3,639,974.

Kaiser, Gary V.: *See*—
Murphy, Charles F.; Webber, J Alan; Kaiser, Gary V.; Van Heyningen, Earle M.; Wright, Ian G.; and Cooper, Robin D. G.,3,641,014.

Kajiura, Hiroshi: *See*—
Tomiyasu, Hiroshi; Inagaki, Tsuguya; Kajiura, Hiroshi, and Watanabe, Kinnosuke,3,640,135.

Kali-Chemie Aktiengesellschaft: *See*—
Milkowski, Wolfgang; Stuhmer, Werner; and Von Eickstedt, Klaus-Wolf, 3,641,125.

Kalle Aktiengesellschaft: *See*—
Sus, Oskar; Uhlig, Fritz; and Schafer, Heinz, 3,640,992.

Kallert, Wilhelm: *See*—
Konig, Klaus; Muller, Erwin; Kallert, Wilhelm; and Muhlhausen, Cornelius,3,640,967.

Kalvitis, Robert E.: *See*—
Cassano, James R.; Smith, Charles E.; and Kalvitis, Robert E.,3,640,614.

Kamada, Sueo: *See*—
Hashiguchi, Yasuhisa; and Kamada, Sueo,3,641,105.

Kamata, Masamoto: *See*—
Arimura, Tohru; Kamata, Masamoto; Okado, Masaru; and Ichimaru, Takarokuro,3,641,325.

Kamen, Jack M.; and Wilkinson, Carolyn J., said Wilkinson assor. to said Kamen. Tracheal tube with normally expanded balloon cuff. 3,640,282, Cl. 128-351.

Kanada, Takashi; and Tanaka, Toshio. Package with destructible portion for dispensing. 3,640,381, Cl. 206-56.

Kane, John F. Push-pull spring type exercising device. 3,640,529, Cl. 272-83.

Kaneda, Isamu: *See*—
Suzuki, Shigeyuki; Kaneda, Isamu; Takahashi, Masaaki; and Nagai, Hiroshi,3,640,969.

Kanegafuchi Boseki Kabushiki Kaisha: *See*—
Kimura, Isao; and Habata, Hidetsugu, 3,639,953.

Kaneko, Toyo: *See*—
Suzuki, Toshio; and Kaneko, Toyo,3,640,568.

Kanitz, Roy Edwin, to Sperry Rand Corporation. Safety apparatus for mechanical filing cabinets. 3,640,596, Cl. 312-223.

Kanzaki, Hisao: *See*—
Sasaki, Hiroshi, Maruyama, Tatsuo; Kanzaki, Hisao; and Sakamoto, Yasuhiko,3,641,274.

Kaplan, Ephraim H.: *See*—
Richter, Sidney B.; and Kaplan, Ephraim H.,3,641,220.

Kaplan, Richard B.: *See*—
Glaski, Frederick A.; Holzl, Robert A.; and Kaplan, Richard B.,3,640,689.

Kaplow, Milton; and Klose, Robert E., to General Foods Corporation. Shelf stable egg products. 3,640,731, Cl. 99-113.

Kappes, Alfred: *See*—
Stephan, Gerhard; Harst, Heinz; Laux, Gunter; and Kappes, Alfred,3,640,799.

Karinthi, Pierre; and Spire, Etiene, to L'Air Liquid, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method of improving the properties of a ferrous metal in the molten state. 3,640,702, Cl. 75-59.

Karlsen, Asbjorn, to Hardman Aerospace. Seat for reclining chair. 3,640,570, Cl. 297-316.

Kasper, Joseph G.: *See*—
Carlson, Alfred D.; and Kasper, Joseph G.,3,639,940.

Kasselmann, John T., to Bendix Corporation, The. Hydraulic servo actuator arrangement for an adaptive steering system. 3,640,184, Cl. 91-387.

Kasuya, Kazuhiko; Ohta, Wasaburo; and Okuno, Zenjiro, to Kabushiki Kaisha Ricoh. Method for liquid-developing an electrostatic image. 3,640,751, Cl. 117-37.

Katayama, Shitomi; and Horikawa, Hideichi, to Denki Onkyo Co. Ltd. End-blocked copolymers of vinyl monomers with cyclic monomers and method for preparing the same. 3,640,971, Cl. 260-78.3

Kato, Takaaki: *See*—
Sumiyoshi, Masaharu; Sakakibara, Shigeru; Ito, Osamu; and Kato, Takaaki,3,640,151.

Kato, Takotoshi: *See*—
Kinjo, Hisao; Iwabuchi, Yoshitaka; Takashima, Seiichi; Kato, Takotoshi; and Okano, Keigo,3,641,278.

Kato, Tetsuya: *See*—
Ito, Tomiyasu,; Nagata, Koichiro; Ichikawa, Takehiko; and Kato, Tetsuya,3,641,003.

Katz, Norman. Cleaning pollutants from furnace and incinerator smoke and the like. 3,640,054, Cl. 55-228.

Katz, Woolf: *See*—
Polson, Alfred; and Katz, Woolf,3,640,809.

Kau, Donald L.: *See*—
Case, Forrest N.; Garrison, Arthur W.; Kau, Donald L.; and Smiley, David E.,3,640,808.

Kaufman, Martin H.; O'Drobinak, John D.; and Dake, James O., Jr., to United States of America, Navy. Hybrid propellant system. 3,640,070, Cl. 60-220.

Kaufman, Martin H.: *See*—
O'Drobinak, John D.; and Kaufman, Martin H.,3,640,785.

Kawai, Hisashi, to Nippon Dense Company Limited. Device for indicating disconnection of turn signal lamp in a turn signalling system for automotive vehicle. 3,641,490, Cl. 340-55.

Kawamata, Tadashi; Hirota, Eiichi; Mihara, Toshihiro; and Terada, Yukio, to Matsushita Electric Industrial Co., Ltd. Tellurium-iron modified chromium dioxides. 3,640,871, Cl. 252-62.51

Kawamura, Koichi: *See*—
Kawamura, Koreichi; Kawamura, Yoshiko; and Kawamura, Koichi,3,640,463.

Kawamura, Koreichi; Kawamura, Yoshiko; and Kawamura, Koichi. Form-indicating water fountain. 3,640,463, Cl. 239-17.

Kawamura, Yoshiko: *See*—
Kawamura, Koreichi; Kawamura, Yoshiko; and Kawamura, Koichi,3,640,463.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Sugahara, Takashi; Suzuki, Minoru; Fukunaga, Tadayuki; and Fukushima, Shozo, 3,640,069.

Kayser, Lutz Tilo. Rocket engine. 3,640,072, Cl. 60-258.

K.D.G. Instruments Limited: *See*—
Starke, Hans, 3,640,478.

Keane, Peter J.: *See*—
Muse, George H.; and Keane, Peter J.,3,639,980.

Keberle, Wolfgang, to Farbenfabriken Bayer Aktiengesellschaft. Process for the preparation of chloroalkane sulphonyl chlorides. 3,641,140, Cl. 260-543.

Keefe, Thomas R.: *See*—
Hahn, Robert S.; and Keefe, Thomas R.,3,640,138.

Kekish, George T.; James, William G.; and Simons, Duane J., to Nalco Chemical Company. Preparation of polyacrolein-sodium bisulfite adduct. 3,640,933, Cl. 260-29.6

Keller, Michael I.; and Gardner, Dayne G., said Gardner assor. to said Keller. Automatic electronic paging system. 3,641,276, Cl. 179-18.

Kelley, Edward, Corporation: *See*—
Carter, William R.; Slaybaugh, Charles Jay; and Hodgins, Patrick M., 3,640,420.

Kelly, Donald D.: *See*—
Heller, Martin G.; and Kelly, Donald D.,3,640,113.

Kemmer, Frank N.; Robertson, Reid S.; and Mattix, Rodney D., to Nalco Chemical Company. Sewage treatment process. 3,640,820, Cl. 210-6.

Kemp, Robert T., to Mobil Oil Corporation. Mono- and di-halo-1-n-heterocyclovinyl phosphates. 3,641,052, Cl. 260-310.

Kendrick, Zola F. Foot guard. 3,640,006, Cl. 36-8.1

Kepner, Larry A., to Ford Motor Company. Four-speed ratio power transmission mechanism having simple planetary gear units. 3,640,153, Cl. 74-759.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Dokopoulos, Petros, 3,641,289.

Keropian, Michael. Trunk support for sitting patients. 3,640,571, Cl. 297-384.

Kerr McGee Chemical Corporation: *See*—
Donaghu, Fay J., 3,640,876.
Rhees, Raymond C., 3,640,885.

Kerrigan, Vincent: *See*—
Brooks, Martin Frederick; and Kerrigan, Vincent,3,641,093.

Keskkula, Henno: *See*—
Narayana, Munisamappa; Keskkula, Henno; and Mason, Jerry E.,3,641,212.

Kesling, Peter C. Combination buccal tube molar pad and hook. 3,639,986, Cl. 32-14.

Kewanee Machinery & Conveyor Company: *See*—
Womble, George E., 3,640,348.

Keystone Consolidated Industries, Inc.: *See*—
Ostrom, Martin E., 3,639,942.

Keznickl, Eduard, to Vockenhuber, Karl, and Hauser, Raimund. Intermittent drive mechanism for cinematographic apparatus. 3,640,441, Cl. 226-49.

Khoury, Amin J.: *See*—
Hurtig, Carl R.; Ferrari, Andres; and Khoury, Amin J.,3,640,267.

Kidney, Bruce W. Access-providing direct suspended ceiling structure with removalbe locked-in the sections. 3,640,042, Cl. 52-475.

Kiji, Kazuo, to Nippon Electric Company Limited. Character recognition system having a rejected character recognition capability. 3,641,495, Cl. 340-146.3

Kim, Dong H.; and Santilli, Arthur A., to American Home Products Corporation. 5-Hydroxy-7H-pyrrolo[,3-d]pyrimidine-6- carboxylic acid esters and related compounds. 3,641,028, Cl. 260-256.4

Kim, Dong H.: *See*—
Santilli, Arthur A.; and Kim, Dong H.,3,641,027.

Kim, Kee W.: *See*—
Grove, Marvin H.; Kim, Kee W.; and Van Arsdale, Lyle R.,3,641,542.

Kimberlin, Charles N., Jr.: *See*—
Eberly, Paul E., Jr.; and Kimberlin, Charles N., Jr.,3,641,177.

Kimberly-Clark Corporation: *See*—
Hrubecky, Frederick J., 3,639,915.

Kimura, Isao; and Habata, Hidetsugu, to Kanegafuchi Boseki Kabushiki Kaisha. Method of producing carbon fibers. 3,639,953, Cl. 23-209.1

Kimura, Shuji, to Nippon Kogaku K.K. Motor-driven winding device for a camera. 3,640,201, Cl. 95-31.

Kingmann-White, Inc.: *See*—
Nolte, Claude B., 3,640,136.
Kinjo, Hisao; Iwabuchi, Yoshitaka; Takashima, Seiichi; Kato, Takotoshi; and Okano, Keigo, to Victor Company of Japan, Limited. Magnetic disc recording and reproducing time indicator. 3,641,278, Cl. 179-100.2
Kinney, S. P., Engineers, Inc.: *See*—
Kinney, Selwyne P., 3,640,395.
Kinney, Selwyne P., to Kinney, S. P., Engineers, Inc. Automatic self-cleaning strainer. 3,640,395, Cl. 210-334.
Kiovsky, Joseph R.; and Bart, Ronald K., to Norton Company. Bonded low-alumina mordenite. 3,641,095, Cl. 252-455.
Kipping, Vernon L., 1/3 to Jobson, Roger J., and 1/3 to Costello, John P. Illuminated mirror for cosmetic case. 3,641,334, Cl. 240-6.45
KIRSON Patentverwertung und Vertriebsgesellschaft mbH: *See*—
Kirzinger, Horst; and Kirzinger, Alfons, 3,639,954.
Kirwan, Warren J.; and Bruning, Elmer E., to Sunbeam Corporation. Vacuum cleaner. 3,639,941, Cl. 15-372.
Kirzinger, Alfons: *See*—
Kirzinger, Horst; and Kirzinger, Alfons,3,639,954.
Kirzinger, Horst; and Kirzinger, Alfons, to KIRSON Patentverwertung und Vertriebsgesellschaft mbH. Apparatus for making a reinforced web. 3,639,954, Cl. 28-1.
Kistler Instrumente AG: *See*—
Spescha, Gelli; Martini, Karlheinz; and Sonderegger, Hans Conrad, 3,640,130.
Kitagawa, Sumio: *See*—
Yamamoto, Hisao; Kitagawa, Sumio; Inaba, Shigeho; Sakai, Shigeru; Hirohashi, Toshiyuki; Maruyama, Isamu; Akatsu, Mitsuhiro; and Izumi, Takahiro,3,641,002.
Kitajima, Kenichi: *See*—
Hatano, Isao; Kitajima, Kenichi; and Iwatani, Katsumi,3,641,330.
Kitch, Paul E., to Scott Paper Company. Transparency display apparatus. 3,640,613, Cl. 353-23.
Kitching, Anthony George; and Brown, Mervyn, to Rolls Royce Limited. Acoustic linings. 3,640,357, Cl. 181-33.
Kitman, Irwin I. Combination burglar and fire alarm. 3,641,571, Cl. 340-420.
Kittrell, James R.: *See*—
Jaffe, Joseph; and Kittrell, James R.,3,641,096.
Kiumi, Takayuki: *See*—
Maegawa, Harumi; Sato, Yohihiro; Furuhata, Yasuo; and Kiumi, Takayuki,3,641,522.
Kivlen, John A.; Struth, Bert W.; and Weiss, Clifford P., to Esso Research and Engineering Company. Decoking of onstream thermal cracking tubes. 3,641,190, Cl. 260-683.
Kjellin, Per Gunnar: *See*—
Sandstrom, Jan Olof; and Kjellin, Per Gunnar,3,641,049.
Klamer, Reuben B.; and Levy, Marshall, said Levy assor. to said Klamer. Magnetic divining rod game equipment. 3,640,537, Cl. 273-161.
Klamp, Paul, to American Chain & Cable Company, Inc. Conveyor system. 3,640,226, Cl. 104-96.
Klebel, Wolfram, to Kabel- und Metallwerke Gutehoffnungshutte Iktiengesehlschaft. Apparatus for welding thin metal sheets. 3,641,309, Cl. 219-123.
Klein, Carl Robert. Boat crane. 3,640,413, Cl. 214-396.
Klein, David X.: *See*—
Deinet, Adolph J.; and Klein, David X.,3,641,158.
Klein, Gerhart P., to Mallory, P. R., & Co., Inc. Continuous forming of metal oxides. 3,640,854, Cl. 204-28.
Klein, Gerhart P.; and Wingood, Ivan L., to Mallory, P. R., & Co. Inc. Cluster anode for electrolytic capacitors. 3,641,399, Cl. 317-230.
Klein, Lawrence C.; and Stevens, Laurence G., to Universal Oil Products Company. Preparation of cuprous oxide. 3,640,684, Cl. 23-147.
Klimstra, Paul D., to Searle G. D., & Co.17α-(2-Alkynyl)-7α-methylestri-1,3,5(10)- triene-3,17β-diols and esters corresponding. 3,641,068, Cl. 260-397.5
Klockenbrink, Joseph M., to Path Computer Equipment Inc. High-speed illumination apparatus. 3,641,560, Cl. 340-343.
Klose, Robert E.: *See*—
Kaplow, Milton; and Klose, Robert E.,3,640,731.
Knapp, Philip B., to Aptek Industries, Inc. Seed-containing pellet-dispensing equipment. 3,640,428, Cl. 221-211.
Knapsack Aktiengesellschaft: *See*—
Sennewald, Kurt; Ohorodnik, Alexander; and Neumaier, Hubert, 3,641,164.
Knieriemen, Richard P.: *See*—
Goy, Thomas J.; Knieriemen, Richard P.; and Reading, James E.,3,640,390.
Knight, James T.; and Lee, Parley L., to United States of America, Atomic Energy Commission. Removal of nitrite kontaminition from nickel plating solutions. 3,640,805, Cl. 204-130.
Knipfing, Richard T. Envelope opening devices. 3,639,983, Cl. 30-294.
Knopf, George S., to Bendix Corporation, The. Positioning apparatus employing a magnetized screw thread. 3,641,535, Cl. 340-195.
Kobayashi, Ryosuke: *See*—
Nakanishi, Michio; Kobayashi, Ryosuke; Abe, Kozo; and Mukai, Toshihiko,3,641,060.
Kobayashi, Toshio; and Mineshima, Yukihiko, to Fujitsu Limited. Method of timing a sequential approximation encoder. 3,641,562, Cl. 340-347.
Koch, Robert L., II.; and Tredwell, Gilman, to Ashdee Corporation. Electrocoating apparatus. 3,640,814, Cl. 204-300.
Koch, Werner G.; and McCurley, Jack, to LTV Electrosystems, Inc. Force summing multiplex actuator. 3,640,183, Cl. 91-1.
Koeber, Henry J.; and Pendulous range finding device, to Bell & Howell Company. . 3,639,997, Cl. 33-221.
Koehring Company: *See*—
Adams, Gary A., 3,640,408.
Koenig, Richard G.: *See*—
Rapsilber, William E.; and Koenig, Richard G.,3,639,989.
Kogan, Mark: *See*—
Armel, Jack; Kogan, Mark; and Cohen, Howard S.,3,641,342.
Kohler, Josef: *See*—
Labude, Wolfgang; and Kohler, Josef,3,641,471.
Kohler, William H., to Abex Corporation. Tachometer amplifier. 3,640,586, Cl. 303-21.
Kohno, Isao: *See*—
Ishihara, Masao; Sugino, Osakazu; Nishina, Yoshio; Kohno, Isao; and Satoh, Yuzuru,3,640,721.
Kokorudz, Michael, to Wyandotte Chemicals Corporation. Liquid chlorinated polyaryl-polyamine compositions. 3,641,151, Cl. 260-570.
Kokotailo, George T.; and Lawton, Stephen L., to Mobil Oil Corporation. Method of decreasing the potassium content of potassium-containing zeolites. 3,640,680, Cl. 23-111.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Sasaki, Hiroshi; Maruyama, Tatsuo; Kanzaki, Hisao; and Sakamoto, Yasuhiko, 3,641,274.
Kolaian, Jack H., to Texaco Inc. Drilling fluid. 3,640,825, Cl. 252-8.5
Kolb, Gunter: *See*—
Balle, Gerhard; and Kolb, Gunter,3,641,119.
Koleske, Joseph Victor: *See*—
Lundberg, Robert Dean; Koleske, Joseph Victor; Pollart, Dale Flavian; and Smarook, Walter Henry,3,641,204.
Koll, Laurel A., to Hercules Incorporated. Apparatus and process for forming and spraying pesticidal invert emulsion. 3,640,461, Cl. 239-7.
Koltuniak, Michael A.; and Urquhart, Thomas N., to Controlled Power Corporation. Modular power supply with plural rectifier housings each of which contains rectifying devices, a transformer and fan means. 3,641,419, Cl. 321-8.
Komiyama, Eizo. Identification cards. 3,640,009, Cl. 40-2.2
Koncos, Robert: *See*—
Yoo, Jin Sun; and Koncos, Robert,3,641,188.
Kondo, Yusuke: *See*—
Inamura, Seiichi; Kondo, Yusuke; Akita, Minoru; and Chikanari, Kenichi,3,640,509.
Kondoh, Ikuyo: *See*—
Okuno, Zenjiro; Mizuno, Akinori; and Kondoh, Ikuyo,3,640,863.
Konig, Klaus; Muller, Erwin; Kallert, Wilhelm; and Muhlhausen, Cornelius, to Farbenfabriken Bayer Aktiengesellschaft. Process for the preparation of polyurethanes. 3,640,967, Cl. 260-77.5
Konig, Robert J.: *See*—
Rakow, Marvin S.; and Konig, Robert J.,3,640,692.
Koniger, Walter: *See*—
Hintringer, Otmar; Koniger, Walter; and Thorn, Jurgen,3,641,351.
Konings, P., Machinefabriek, Firma: *See*—
Beisemann, Manfred, 3,640,590.
Konishiroku Photo Industry Co., Ltd.: *See*—
Ishihara, Masao; Sugino, Osakazu; Nishina, Yoshio; Kohno, Isao; and Satoh, Yuzuru, 3,640,721.
Shinozaki, Akira, 3,640,622.
Konno, Akira: *See*—
Ohshima, Haruhiko; Mizuno, Hiroshi; Konno, Akira; and Kosaka, Tomoaki,3,641,270.
Konoki, Keizo; and Ohsaki, Kozo, to Toyo Engineering Corporation, and Mitsui Toatsu Chemicals, Inc. Process for removing carbon dioxide in a combined system for producing ammonia and urea. 3,640,052, Cl. 45-19.
Konrad, Charles E.; and Chausse, Burnette P., to General Electric Company. Frequency polyphase power supply. 3,641,566, Cl. 340-347.
Kopp, Adolph, Jr. Process for collecting and storing fresh water in earth. 3,640,074, Cl. 61-1.
Koppers Company, Inc.: *See*—
Taschenberg, Ernest J., 3,640,541
Koreska, W.: *See*—
Schutzner, Walter, 3,640,750.
Korosi, Jeno; and Csaba, Gyorgy, to Egyesult Gyogyszer es Tapszergyar. Thionine derivatives. 3,641,016, Cl. 260-243.
Korsak, Kazimierz, to Piasecki Aircraft Corporation. Servo control for dual hydraulic systems. 3,640,185, Cl. 91-411.
Kosaka, Masahiro; and Fujita, Tadamasa, to Matsushita Electric Industrial Co., Ltd. Electronic teaching apparatus. 3,641,507, Cl. 340-172.5
Kosaka, Tomoaki: *See*—
Ohshima, Haruhiko; Mizuno, Hiroshi; Konno, Akira; and Kosaka, Tomoaki,3,641,270.
Kosoczky, Ibolya: *See*—
Rakoczi, Jozsef; Mikite, Gyula; Petocz, Lujza; Fischer, Janos; Grasser, Katalin; and Kosoczky, Ibolya,3,641,039.

Kossen, Dale J.; Foster, Richard W.; and Benson, Charles R., to Alarm Lock Company, Inc. Electrically actuated switch combinated operating device for permitting operation of latches and mechanisms. 3,641,396, Cl. 317-134.

Kostelecky, Premysl: *See*—
Sedlarik, Jargslav; Havlas, Jiri; and Kostelecky, Premysl,3,640,440.

Kouth, Herbert; and Marr, Fritz, to Golde, H. T., GmbH. Window guiding device. 3,640,022, Cl. 49-420.

Kovacs, Lloyd: *See*—
Gasior, Joseph; and Kovacs, Lloyd,3,640,661.

Kraft, Paul, to Stauffer Chemical Company. Treatment of polyvinyl halides. 3,640,954, Cl. 260-45.95

Krajewski, John J.: *See*—
Lang, William J.; and Krajewski, John J.,3,640,826.

Kramer, David C.: *See*—
McInnis, Andrew M.; Ballard, Louis M.; Rogers, Waldo I.; Kramer, David C.; and Nielsen, Robert A.,3,639,990.

Kramer, George M., to Esso Research and Engineering Company. Ether promoters for Lewis acid catalyzed isomerization process. 3,641,185, Cl. 260-683.76

Krauch, Carl Heinrich; and Sanner, Axel, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of poromeric materials. 3,640,753, Cl. 117-62.2

Kraus, Charles E., to Excelermatic, Inc. Motion transmission drive. 3,640,145, Cl. 74-248.

Krause, Gerhard, to Fernseh GmbH. Shift register. 3,641,363, Cl. 307-221.

Krawetz, Barton, to United States of America, Atomic Energy Commission. Electron beam-pumped gas laser system. 3,641,454, Cl. 331-94.5

Kreidermacher, Leonard L.; and Hudson, David M., to Honeywell Inc. Apparatus for performing arithmetic operations on numbers using a multiple generating and storage technique. 3,641,331, Cl. 235-159.

Krenzer, John: *See*—
Richter, Sidney B.; and Krenzer, John,3,641,143.

Kress, Robert F.; and Lorenz, Eldon L., to Michigan Wheel Corporation. Marine flow through propeller. 3,640,642, Cl. 416-93.

Krieger, Heinrich: *See*—
Waschk, Fritz; Muller, Jurgen; Krieger, Heinrich; and Heindrich, Gunter,3,640,205.

Krieger, Paul E.: *See*—
Trepanier, Donald L.; and Krieger, Paul E.,3,641,019.

Krimm, Heinrich; Schnell, Hermann; and Lenz, Gunther, to Farbenfabriken Bayer Aktiengesellschaft. Linear polyurethanes of di- or tri-nuclear N,N'- dialkyldiamines and di- or tri-nuclear dihydroxyl compound. 3,640,955, Cl. 260-47.

Kriser Corporation: *See*—
Shatz, Abram; and Eisenberg, Ben, 3,640,620.

Krohn-Holm, Danckert. Guide pulley and a method for the production thereof. 3,640,143, Cl. 74-230.05

Kruse, Walter M., to Hercules Incorporated. Epoxidation of olefins with thallic carboxylates. 3,641,067, Cl. 260-348.5

Kubo, Moritada; Shigehara, Masamichi; and Nogiwa, Yasuo, to Tokyo Shibaura Electric Co., Ltd. Apparatus for detecting the attitude of an artificiil satellite. 3,641,347, Cl. 250-83.3

Kuchler, Abraham: *See*—
Hollingsead, Robert A.; Kuchler, Abraham; and Pryor, Clyde Robert,3,640,141.

Kuder, Robert C., to General Mills, Inc. Cycloaliphatic carboxylic anhydride reaction and reaction products. 3,641,144, Cl. 260-546.

Kuhns, Roger J., to Avant Incorporated. Method for cutting out individual pictures from a multiple image picture. 3,640,161, Cl. 83-36.

Kulicke and Soffa Industries, Inc.: *See*—
Angelucci, Thomas L., 3,641,304.

Kulish, Stanley J., Jr.: *See*—
Boudourin, Angelo; Kulish, Stanley J., Jr.; and Plumadore, Harold M.,3,640,611.

Kumpolt, Karl. Portable dock levellers. 3,639,935, Cl. 14-72.

Kundo, Kishichiro; Iwata, Hiroo; Yamaguchi, Nario; Shimizu, Sakae; and Tubuko, Kazuo, to Kabushiki Kaisha Ricoh, and Toa Gosei Chemical Industry Co., Ltd. Electrophotographic copying material and process of producing thereof. 3,640,709, Cl. 96-1.5

Kuper, Donald G., to Phillips Petroleum Company. Process for the production of aromatic polycarboxylates. 3,641,130, Cl. 260-515.

Kuramada, Tomoyuki: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Matsui, Katsuaki; Kuramada, Tomoyuki; Watanabe, Ichiro; and Ohta, Noriyuki,3,640,928.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Suzuki, Shigeyuki; Kaneda, Isamu; Takahashi, Masaaki; and Nagai, Hiroshi, 3,640,969.

Kurokawa, Susumu: *See*—
Iimura, Tsutomu; Kurokawa, Susumu; and Emoto, Masayuki,3,640,867.

Kurtz, Edward, Jr.: *See*—
Bauman, Joseph F.; Kurtz, Edward, Jr.; Cini, Adrian V.; and Antrobus, Robert E.,3,640,312.

Kurz, Otmar J. G., to Verolme Vacuumtechnik Aktiengesellschaft. Heat-insulating material. 3,640,832, Cl. 161-160.

Kuster, Howard L., to Goodrich, B. F., Company, The. Fluid operated actuator. 3,640,564, Cl. 294-99.

Kuykendall, James H., to TRW Inc. Regenerative voltage regulators. 3,641,424, Cl. 323-17.

Kyburz, Emilio; and Spiegelberg, Hans, to Hoffmann-La Roche Inc.N-oxides of aminoalkylene-dibenzo-[a,d] cycloheptenes and the slats thereof. 3,641,153, Cl. 260-570.8

Kyowa Hakko Kogyo Kabushiki Kaisha: *See*—
Uzu, Keizo; Nakano, Kinichi; and Takahashi, Toshinaka, 3,641,053.

Kysor Industrial Corporation: *See*—
Pioch, Robert J., 3,640,410.

Labude, Wolfgang; and Kohler, Josef, to Preh Elektrofeinmechanische Werke. Adjusting unit. 3,641,471, Cl. 338-128.

Lachambre, Jean L., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Pyroelectric joule meter using a divergent lens. 3,641,346, Cl. 250-83.

Lacoste, Roger G.: *See*—
Wiley, Morris A.; Lacoste, Roger G.; Henry, Clemence J.; and Waldbillig, James O.,3,640,872.

Laenen, Nicholas M.; and Cooper, James M., to NRM Corporation. Tire curing press. 3,640,653, Cl. 425-33.

La Flair, Ronald Turner; and Henderson, John Frederick, to Polymer Corporation Limited. Rubbery polymeric blends. 3,641,205, Cl. 260-876.

La Freniere, Lawrence J.: *See*—
Forbes, Hampton E., Jr.; and La Freniere, Lawrence J.,3,640,447.

Laible, Franz. Plant potting machine. 3,640,020, Cl. 47-1.

L'Air Liquid, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude.*See*—
Karinthi, Pierre; and Spire, Etiene, 3,640,702.

Lambert, Ronald F.: *See*—
Buckler, Sheldon A.; and Lambert, Ronald F.,3,640,713.

Lamp, Paul F., to Electone, Inc. Hearing aid switch. 3,641,288, Cl. 200-52.

Lancaster, Edgar D., Jr.: *See*—
Cricchi, James R.; and Lancaster, Edgar D., Jr.,3,641,511.

Landwehrkamp, Hans, to Schwbezt & Salzey Machinenfabrik Aktiengesellschaft. Method and apparatus for spinning a fiber band. 3,640,061, Cl. 57-58.59

Lane, Lynn R.: *See*—
Allen, Terry S.; Lane, Lynn R.; and Swartz, Harold Lee,3,640,137.

Lang, William J.; and Krajewski, John J., to International Minerals & Chemical Corporation. Graft copolymers of acrylic acid and polyhydroxy polymeric compounds for treating clays. 3,640,826, Cl. 252-8.5

Langensiepen, Max, Kom. Ges. Emmendingen: *See*—
Querfeld, Hermann; Mattes, Heinz Otto; and Flesch, Friedrich, 3,640,043.

Langer, Philippe. Method and apparatus for the measurement of duration of ultra short pulses of monochromatic light. 3,641,343, Cl. 250-71.

Lankard, David R.; and Sheets, Herbert D., Jr., to United States Steel Corporation. Composition for marking hot metal. 3,640,737, Cl. 106-19.

Lapeyre, James M. Method of installing breakwater caissons. 3,640,075, Cl. 61-5.

Lard, Edwin W.: *See*—
Frank, Victor S.; Lard, Edwin W.; and Stahly, Eldon E.,3,641,193.

Lard, Edwin W. Method of producing nonburning paper. 3,640,763, Cl. 117-126.

Larkin, Mark E., to Phillips Petroleum Company. Method and apparatus for forming plastic-lined metal conduit. 3,639,970, Cl. 29-411.

Larsson, Hans Tord E., to TEFA Industri Aktiebolag. Tightening ring having a rigid liner and an elastomeric ring mounted thereon. 3,640,540, Cl. 277-25.

La Tourrette, James T.; Newstein, Maurice C.; and Rabinowitz, Paul J., to Control Data Corporation, mesne. Mode selective laser with small feedback reflector and diffraction coupled output. 3,641,458, Cl. 331-94.5

Lau, Dicksen T. W. Registering and calling system for waiting numbers. 3,641,553, Cl. 340-286.

Lauchlan, Robert L., to Uniroyal, Inc. Thermoplastic resin blend of polysulfone resin and an ethylene-propylene terpolymer or graft derivative thereof. 3,641,207, Cl. 260-876.

Laux, Gunter: *See*—
Stephan, Gerhard; Harst, Heinz; Laux, Gunter; and Kappes, Alfred,3,640,799.

Law, Patrick Raymond. Chopstick device. 3,640,561, Cl. 294-16.

Lawrence, Willis G.; and Coffin, Leon B., to Research Corporation, mesne. Method of making a permeable ceramic mold used as a substitute for plaster of Paris molds. 3,641,229, Cl. 264-43.

Lawson, Junior J.: *See*—
Hall, Richard H.; Roberts, Carleton W.; Sikkema, Andrew J.; and Lawson, Junior J.,3,641,208.

Lawton, Stephen L.: *See*—
Kokotailo, George T.; and Lawton, Stephen L.,3,640,680.

Lazarus, Stanley D., to Allied Chemical Corporation. Process for direct esterification of terephthalic acid with an alkylene glycol. 3,641,111, Cl. 260-475.

L & C Steinmuller G.m.b.H.: *See*—
Jung, Richard; and Lenkewitz, Horst, 3,640,475.
Jung, Richard, 3,640,499.

Lea, Hans, to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler. Vacuum stirring device for dental materials. 3,640,510, Cl. 259-108.

Leach Corporation: *See*—
Norris, Kermit A., 3,641,524.

Leath, McCarthy & Maynard, Inc.: *See*—
Page, Howard M., 3,639,987.

Lebourg, Maurice P. Drill bit. 3,640,355, Cl. 175-329.

Leclerc, Lucien. Folding door or the like. 3,640,333, Cl. 160-183.

Lederrey, Marc; and Grenchen, Canton, to Schlup & Cie, S. A. Watertight watchcase for wrist-watches. 3,640,065, Cl. 58-90.

Lee, Bernard Shing-Shu; and Schora, Frank C., Jr., to Institute of Gas Technology. Desulfurization of coal. 3,640,016, Cl. 44-1.

Lee, Charles A.; and Sorrells, Frank D., to International Paper Company, mesne. System for removing condensate from a rotary dryer. 3,640,000, Cl. 34-125.

Lee, Haynes A., Jr.; and Rapp, Charles F., to Owens-Illinois, Inc. Lithia silica glass laser containing various other alkali oxides. 3,640,890, Cl. 252-301.4

Lee, Haynes A., Jr.; and Rapp, Charles F., to Owens-Illinois Inc. Lithia-silica glass laser containing various alkaline earth oxides. 3,640,891, Cl. 252-301.4

Lee, Parley L.: *See*—
Knight, James T.; and Lee, Parley L.,3,640,805.

Lee, Paul H., to Perkin-Elmer Corporation, The. Method and apparatus for producing high power single frequency radiation. 3,641,456, Cl. 331-94.5

Leeds & Northrup Company: *See*—
Blum, Bernard; and Schwartzenberg, John W., 3,640,119.

Leesona Corporation: *See*—
Nelson, John; and Stoppard, William E., 3,640,160.

Le Febvre, Gilles: *See*—
Phung, Nhu Hung; and Le Febvre, Gilles,3,640,987.

Le Grand, Donald G.: *See*—
Bostick, Edgar E.; Gaines, George L., Jr.; and Le Grand, Donald G.,3,640,943.

LeHenaff, Jacques, to Compagnie Electro-Mecanique. Arrangement for securing conductors of stator winding of dynamo-electric machine. 3,641,378, Cl. 310-214.

Lehmann, Wolfgang: *See*—
Ziemann, Heinz; Lehmann, Wolfgang; and Troemel, Gerhard,3,640,840.

Leidigh, William J., to Varian Associates. High power microwave excited plasma discharge lamp. 3,641,389, Cl. 315-39.

Leiner, Robert L.; and Avena, Salvatore, to Curtiss-Wright Corporation. Power driven actuator of the compound planetary gear type. 3,640,150, Cl. 74-674.

Lenkewitz, Horst: *See*—
Jung, Richard; and Lenkewitz, Horst,3,640,475.

Lenz, Gunther: *See*—
Krimm, Heinrich; Schnell, Hermann; and Lenz, Gunther,3,640,955.

Lenz, John O. Parallel mechanism. 3,640,231, Cl. 108-106.

Leonard, John M.: *See*—
Lutz, Leland H.; Heileman, Richard C.; Upstone, Harlan R.; Leonard, John M.; and Ottow, Melvin A.,3,639,950.

Leonard, Ronald James; and Cohen, Fred Michael, to Baxter Laboratories, Inc. Heat exchange device with convoluted heat transfer wall. 3,640,340, Cl. 165-166.

Leonhard, Hofheim: *See*—
Oberst, Hermann; Leonhard, Hofheim; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,835.

Lesher, John C., 50% to Barber, James. Remote monitoring and control system. 3,641,539, Cl. 340-213.1

Lester Engineering Company: *See*—
Schwartz, William H., 3,640,662.

Le Therisien, Louis G.; and Marion, Henri A., to Compagnie Francaine des Petroles. Method and apparatus for connecting two submerged inhabitable enclosures. 3,640,079, Cl. 61-69.

Lettre, Hans; and Fitzgerald, Thomas J., to Merck, E., A. G. Halocolchicine derivatives. 3,641,146, Cl. 260-562.

Levene, Leon; and Thomas, Ian M., to Owens-Illinois, Inc. Process of converting metalorganic compounds and high purity products obtained therefrom. 3,640,093, Cl. 65-134.

Lever Brothers Company: *See*—
Martin, John Robert, 3,640,880.
Rubin, Fred K.; and Carmack, Carl J., 3,640,875.

Levine, Leonard, to Dow Chemical Company, The. 4,4'-(lower-alkylenedithio or disulfonyl)-bis- tetrakalo pyridines and derivatives thereof. 3,641,033, Cl. 260-294.8

Levine, Wilbur J.: *See*—
Greanias, Evon C.; and Levine, Wilbur J.,3,641,500.

Levy, Marshall: *See*—
Klamer, Reuben B.; and Levy, Marshall,3,640,537.

Lewis, Arthur E. In situ pressure leaching method. 3,640,579, Cl. 299-4.

Lewis, Benjamin Arthur; Sassiver, Martin Leon; and Shepherd, Robert Gordon, to American Cyanamid Company. 7-(Phenylacetylamino)cephalosporin carboxamides and 7-(thiophene-2-acetylamino) cephalosporin carboxamides. 3,641,015, Cl. 260-243.

Lewis, Linford H. Receptacle device. 3,640,451, Cl. 232-43.1

LFE Corporation: *See*—
Brockett, Peter C.; and Pallat, Ludwig R., 3,641,486.

Liaaen, Anders M., to A. M. Liaaen A/S. Controllable pitch propeller system. 3,640,644, Cl. 416-157.

Lian, Kenneth T.; and Long, Willis F., to Hughes Aircraft Company. Consecutive crowbar circuit breaker. 3,641,358, Cl. 307-136.

Liao, Tseng W., to General Electric Company. Scheme for reducing audible noise developed by an extra-high voltage transmission line. 3,641,251, Cl. 174-40.

Libby, Hugo L.: *See*—
Neeley, Victor I.; and Libby, Hugo L.,3,640,598.

Liberman, Herbert E.: *See*—
Hoogendoorn, Helen M.; Liberman, Herbert E.; Narken, Bernt; and Sunners, Brian,3,639,976.

Licata, William H.: *See*—
Chatham, James R.; and Licata, William H.,3,640,178.

Lieberman, Abraham Buddy. Wicket bags. 3,640,450, Cl. 229-53.

Lieberman, David A.: *See*—
Florsheim, Leonard S., Jr.; Lieberman, David A.; Archer, Harold B.; and Nothmann, Gerhard A.,3,640,623.

Liebig, Rita: *See*—
Scharf, Hans-Dieter; Droste, Wilhelm; and Liebig, Rita,3,641,057.

Light, Stanley. Knockdown structural toys. 3,640,018, Cl. 46-29.

Lilly, Eli, and Company: *See*—
Davis, William W.; and Ose, Earl E., 3,641,241.
Hayes, Harold B.; and Huff, Gerald L., 3,641,018.
Murphy, Charles F.; Webber, J Alan; Kaiser, Gary V.; Van Heyningen, Earle M.; Wright, Ian G.; and Couper, Robin D. G., 3,641,014.
Ryan, Charles W., 3,641,021.

Limberg, Allen Leroy; and Steckler, Steven Alan, to RCA Corporation. Protection circuit. 3,641,361, Cl. 307-202.

Limberger, Jurgen, to Lumoprint Zindler KG, Firma. Presettable counter for copying apparatus. 3,641,322, Cl. 235-132.

Lin, Chao-Han; and Wright, Arthur J., to National Cash Register Company, The. 5- and 6-dialkylaminobenzylid-eneaminofluorans. 3,641,011, Cl. 260-240.

Lincoln Manufacturing Company: *See*—
Rhoads, Delmar D.; and Mac Kay, Robert H., 3,641,263.

Linde Aktiengesellschaft: *See*—
Hildebrandt, Peter; and Ruckdeschel, Walter, 3,641,311.

Linde, Hans; and Thienel, Peter, to Berthold, H., Messinglinienfabrik und Schriftgiesserei AG. Line drawing apparatus in photographic composing machines. 3,640,193, Cl. 95-4.5

Linden, Gerbert: *See*—
Ost, Walter; Thomas, Klaus; Jerchel, Dietrich; and Linden, Gerbert,3,641,062.

Linden-Alimak Aktiebolag: *See*—
Granskog, Roland, 3,640,349.

Linderman, Roger C.; and Cline, Charles D., to CPC International Inc. Flame retardant composition. 3,640,823, Cl. 252-8.1

Lindner, Ernst: *See*—
Radscheit, Kurt; Stache, Ulrich; Haede, Werner; Fritsch, Werner; and Lindner, Ernst,3,641,009.

Lindner, Herbert, GmbH, Firma: *See*—
Stahn, Georg, 3,640,024.

Lindo, Neil A.: *See*—
Zinnes, Harold; Shavel, John, Jr.; and Lindo, Neil A.,3,641,032.

Lindsay Specialty Products Limited: *See*—
Crowhurst, David B.; and Thomas, John E., 3,641,464.

Lindsey, Hiram E., Jr.: *See*—
Braddick, Britt O.; Lindsey, Hiram E., Jr.; and McKiearnan, Charles J.,3,640,341.

Lindsey, L. E. Power conductor stringing assembly. 3,640,504, Cl. 254-134.3

Lindstrom, Ronald E.: *See*—
Scheiner, Bernard J.; Lindstrom, Ronald E.; and Henrie, Thomas A.,3,639,925.

Liongas Aktiengesellschaft: *See*—
Elkuch, Ludwig, 3,640,320.

Lipper, Harold A.: *See*—
Nakazawa, Yoshio; and Lipper, Harold A.,3,640,036.

Liskowitz, John W., to American Standard Inc. Measuring of the concentration of solid particles suspended in various regions in a fluid using polarized light. 3,640,626, Cl. 356-103.

Litton Business Systems, Inc.: *See*—
Wyke, Edward R., 3,640,221.

Litton Precision Products, Inc.: *See*—
McAdams, Hugh P., Jr., 3,641,532.

Litton Systems, Inc.: *See*—
Cushman, Glenn F.; Prasad, Brijeshwari,; and Wisleder, Robert W., 3,641,563.

Litvin, Noel, 50% to Scherz, Abraham Isaac. Key controlled locks. 3,640,107, Cl. 70-129.

Litzell, John E.: *See*—
Waner, Donald W.; Litzell, John E.; and Olsen, Roger F.,3,640,155.

Liu, Gordon Y. T.: *See*—
Strange, Carl P.; and Liu, Gordon Y. T.,3,641,211.

Liu, Wen Chih, to Pfizer Inc. Active material of entada phaseoloides. 3,641,243, Cl. 424-195.

Livingston, Douglas J., to Harowe Servo Controls Inc. Single drag cup motor generator. 3,641,376, Cl. 310-113.

Lloyd, John George; and Fripp, Alan, to Bell Punch Company Limited. Calculating machines. 3,641,501, Cl. 340-172.5

Lockheed Aircraft Corporation: *See—*
Searle, Norman; and Tatom, John W., 3,640,468.
Loeffler, Larry J., to Merck & Co., Inc. Anti-fibrinolytic compounds. 3,641,128, Cl. 260-514.
Loeffler, Larry J., to Merck & Co., Inc. Anti-fibrinolytic compounds. 3,641,129, Cl. 260-514.
Loehr, Clifford E.: *See—*
Darr, Donald E.; Edwards, G Byron; Loehr, Clifford E.; and Young, Elgin E.,3,640,745.
Lonati, Francesco. Pusher unit for double cylinder knitting machines. 3,640,095, Cl. 66-147.
Long, Loren M.: *See—*
Schweiss, Dieter; and Long, Loren M.,3,641,010.
Long, Willis F.: *See—*
Lian, Kenneth T.; and Long, Willis F.,3,641,358.
Longland, John R.; Williams, Roy M., Jr.; Sutton, Howard D.; and Scopelite, Thomas M., to Sanders Associates, Inc. Position busy signalling apparatus. 3,641,324, Cl. 235-151.
Looker, Olin L., to FMC Corporation. Corn harvester with trash blower. 3,640,055, Cl. 56-106.
Lorenz, Eldon L.: *See—*
Kress, Robert F.; and Lorenz, Eldon L.,3,640,642.
Lorenz, Rainer, to U.S. Philips Corporation. Method of fixing images consisting of dry powders on paper. 3,640,749, Cl. 117-28.
Lorincz, Eugene M., to Wessel Hardware Corporation. Key-operated chain door-lock construction. 3,640,106, Cl. 70-93.
Loughlin, Bernard D., to Hazeltine Corporation. Flare light compensator. 3,641,259, Cl. 178-7.5
Love, Dennis Anthony; Neal, David Patrick John; and Pidgeon, Eric, to Beecham Group Limited. Process for preparing α-carboxylbenzylpencillin. 3,641,001, Cl. 260-239.1
Love, Frank E., to National Lead Company. Continuous process and apparatus for electrolytic production of sodium metal from sodium salts. 3,640,801, Cl. 204-68.
Lowe, William L.: *See—*
Sterner, Russell L.; and Lowe, William L.,3,641,551.
Loxley, Ted A.; Webb, John M.; and Barber, Walter G., to Mellen, Edward J., Jr. Wafer boat. 3,640,398, Cl. 211-41.
LRC Research and Development Company: *See—*
Fitzgerald, Walter P., Jr., 3,640,879.
LTV Electrosystems, Inc.: *See—*
Koch, Werner G.; and McCurley, Jack, 3,640,183.
Lubricant compositions comprising substituted: *See—*
Gemmill, Robert M., Jr.; Schick, John W.; and Mobil Oil Corporation, 3,640,870.
Luby, John J.; and Pemberton, Paul E., to Overhead Door Corporation. Roll-type door. 3,640,332, Cl. 160-133.
Ludell Mfg. Co.: *See—*
Lutzen, William C.; and Berry, Edward J., 3,640,104.
Ludwig, David P., to Western Electric Company, Incorporated. Apparatus for compliant bonding. 3,640,444, Cl. 228-4.
Lugo, Luigi: *See—*
Reni, Cesare; and Lugo, Luigi,3,641,233.
Lumidor Products Corporation: *See—*
Rogers, John J.; and Stratman, John A., 3,641,487.
Lummus Company, The: *See—*
Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., 3,641,157.
Lumoprint Zindler KG, Firma: *See—*
Limberger, Jurgen, 3,641,322.
Lund, Roger E.; and Hofmann, Gunter A. G., to Hughes Aircraft Company. Switching device. 3,641,384, Cl. 313-161.
Lundberg, Robert Dean; Koleske, Joseph Victor; Pollart, Dale Flavian; and Smarook, Walter Henry, to Union Carbide Corporation. Adhesive composition poly(vinyl alkyl ether) and a cyclic ester polymer. 3,641,204, Cl. 260-874.
Lundeen, Allan J.; and Yates, James F., to Continental Oil Company. Oxidation of aluminum alkyls. 3,641,085, Cl. 260-448.
Lundgreen, Michael W.; and Denniston, Rollin H., to Collins Radio Company. Digital echo protection circuit for DME and tacan. 3,641,572, Cl. 343-7.3
Lundstrom, Hans, to Allmanna Svenska Elektriska Aktiebolaget. Press for hydrostatic extrusion having a composite cylinder externally excused to high pressure. 3,640,111, Cl. 72-60.
Lundstrom, Hans, to Allmanna Svenska Elektriska Aktiebolaget. Cylinder for ultra high pressure. 3,640,186, Cl. 92-169.
Lunn, Gerald K., to Motorola, Inc. Gain controlled differential amplifier circuit. 3,641,450, Cl. 330-30.
Lutovsky, Josef; and Prasil, Vladimir, to Elitex-Zavody lextilniho strojirenstvi generalni reditelstvi. Method of spinning/in yarn upon interruption of the spinning process in spindleless spinning machines and device for performing said method. 3,640,059, Cl. 57-34.
Lutz, Charles William, to FMC Corporation. Phosphate glass bodies. 3,640,827, Cl. 252-8.55
Lutz, Leland H.; Heileman, Richard C.; Upstone, Harlan R.; Leonard, John M.; and Ottow, Melvin A., to International Telephone and Telegraph Corporation. Latching device. 3,639,950, Cl. 24-230.
Lutzen, William C.; and Berry, Edward J., to Ludell Mfg. Co. Mechanized door. 3,640,104, Cl. 68-210.
Lynas, Derek L.; and Cross, Walter G., to Rolls Royce Limited. Vibration monitoring systems. 3,641,550, Cl. 340-261.
Lynch, James E., to American Lava Corporation. Leadless ceramic package for integrated circuits. 3,641,401, Cl. 317-234.
Lyon, Gilbert T. Stock pusher. 3,640,442, Cl. 226-158.
Lyons, James E., to Sun Oil Company. Diolefin disproportionation reactions. 3,641,174, Cl. 260-666.
Lythe, Revor Wilkinson; and Ashworth, Edward Arnold, to Steetley (Mfg.) Ltd. Basic refractories. 3,640,518, Cl. 263-52.
Maag Gear Wheel & Machine Company Limited: *See—*
Wydler, Robert, 3,640,650.
Machlett Laboratories, Incorporated, The: *See—*
Sholl, Herbert L., 3,641,387.
Mac Kay, Robert H.: *See—*
Rhoads, Delmar D.; and Mac Kay, Robert H.,3,641,263.
MacKenzie, Robert D.: *See—*
Tilford, Charles H.; Blohm, Thomas R.; and MacKenzie, Robert D.,3,641,155.
Mackey, E. Scudder, to GAF Corporation. Antihalation photographic media and method of preparation. 3,640,748, Cl. 117-33.3
Mackiw, Vladimir Nicolaus: *See—*
Zubryckyj, Nicolas; Mackiw, Vladimir Nicolaus; and Weir, Donald Robert,3,640,706.
MacLean, Charles C., III; and Villa, Alfonso, to Freeman, Hovey T., Jr. Cast-in-place structural truss slab and manufactured pan. 3,640,040, Cl. 52-337.
Macovski, Albert, to RCA Corporation. Non-interacting lens system for a color encoding camera. 3,641,255, Cl. 178-5.4
Macovski, Albert, to American Express Investment Management Company. Hologram reproduction system using an optical grating. 3,641,264, Cl. 178-6.5
Maeda, Yutaka; and Hirata, Kinya, to Okuma Machinery Works Ltd. Control system for DC motor. 3,641,409, Cl. 318-258.
Maegawa, Harumi; Sato, Yohihiro; Furuhata, Yasuo; and Kiumi, Takayuki, to Fujitsu Limited. Inductance element for preventing half-select noise in memory elements. 3,641,522, Cl. 340-174.
Magnuson, Robert: *See—*
Elliott, Melvin R., 3,640,378.
Maher, Frank A., to Vapor Corporation. Method of making a heat exchanger coil assembly. 3,639,963, Cl. 29-157.3
Maier, Martin; and Wolf, Eberhard, to Maschinenfabrik Fahr Aktiengesellschaft. Hay-harvesting implements. 3,640,056, Cl. 56-370.
Main, George, to Republic Steel Corporation. Seal for moving strip. 3,640,543, Cl. 277-237.
Makachev, Nikolai Ivanovich; Parshin, Alexei Nikolaevich; Smurov, Georgy Sergeevich; and Stepanets, Alexei Trofimovich. Rapier in the device for inserting weft thread into the loom warp shed. 3,640,316, Cl. 139-127.
Malczewski, Jeremie, to Societe Anonyme dite: Bronzavia. Apparatus for disinfecting and disinfesting premises. 3,640,464, Cl. 239-69.
Malden, Ancile E.: *See—*
Hogan, Walter J.; and Malden, Ancile E.,3,641,559.
Mallory, P. R., & Co., Inc.: *See—*
Broverman, Irwin, 3,641,298.
Klein, Gerhart P., 3,640,854.
Klein, Gerhart P.; and Wingood, Ivan L., 3,641,399.
Mullin, William F., 3,641,488.
Stafford, Richard W.; and Cuckovic, Milenko, 3,640,142.
Mammino, Joseph; and Ferguson, Robert M., to Xerox Corporation. Phthalocyamine photoconductive elements containing multiple binder materials. 3,640,710, Cl. 96-1.5
Mandel, Louis, to United States of America, Navy. Klystron automatic tube tester. 3,641,428, Cl. 324-24.
Manfredi, Frank A. System for reducing and controlling exhaust emissions from internal combustion engines. 3,640,254, Cl. 123-119.
Mangion, Charles: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,640,256.
Mann, Robert L., to Resinoid Engineering Corporation. Arbor press power source. 3,640,068, Cl. 60-52.
Mansfield, Richard C.; and Rainey, James L., to Rohm and Haas Company. Alkylene oxide adducts of alkyl oligosaccharides and their mixtures with alkylene oxide adducts of both alkyl glucosides and alkanols. 3,640,998, Cl. 260-210.
Mansukhani, Gobind R. Flushing apparatus. 3,639,918, Cl. 4-67.
Marasco, Anthony D.: *See—*
Savoca, Paul C.; and Marasco, Anthony D.,3,641,478.
Marathon Manufacturing Company: *See—*
Fitchman, Arthur E.; and Nathe, Raymond J., 3,640,775.
Marathon Oil Company: *See—*
Argabright, Perry A.; and Rider, Harold D., 3,641,024.
Maremont Corporation: *See—*
Anderson, Gordon C.; and Page, John D., 3,640,062.
Margulis, Rajko R.: *See—*
Hymes, Alan C.; Margulis, Rajko R.; and Nalbandian, Robert M.,3,641,240.
Marine Electro Mechanical, Inc.: *See—*
Turk, James R., 3,640,131.
Marion, Henri A.: *See—*
Le Therisien, Louis G.; and Marion, Henri A.,3,640,079.
Marketers, Inc.: *See—*
Huffman, William W., 3,640,380.
Markle, David A., to Perkin-Elmer Corporation, The. Solar stimulated fluorescent radiation detection method and apparatus. 3,641,344, Cl. 250-71.
Maropis, Nicholas, to Aeroprojects Incorporated. Apparatus for delivering vibratory energy. 3,640,180, Cl. 90-11.
Marquardt Industrial Products Co.: *See—*
Peel, Richard V.; and Phillips, Billie W., 3,641,338.

Marquis, David M.; and Sweeney, William A., to Chevron Research Company. Process for thehydrolysis of olefin-sulfur trioxide reaction product mixtures. 3,641,131, Cl. 260-513.

Marr, Fritz: *See*—
Kouth, Herbert; and Marr, Fritz,3,640,022.

Marrero, Michael T.: *See*—
Murphree, Francis J.; and Marrero, Michael T.,3,641,485.

Marshall, John Stephen; and Turnbull, William S., to Rubery, Owens and Company Limited. Hydraulic power transmission systems. 3,640,066, Cl. 60-53.

Martin, Donald J., to Stauffer Chemical Company. Method of preparing 1,4-oxathianes and derivatives thereof. 3,641,054, Cl. 260-327.

Martin, Irvin J.: *See*—
Stowe, Robert A.; and Martin, Irvin J.,3,641,180.

Martin, John Robert, to Lever Brothers Company. Hard surface cleaner. 3,640,880, Cl. 252-161.

Martin, William A.; and Bielicki, Marvin S., to Eastman Kodak Company. Control apparatus for a tape drive. 3,641,282, Cl. 179-100.2

Martin, Wolfgag: *See*—
Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgag; Fessmann, Heinz; and Hahn, Edeleried,3,640,063.

Martini, Karlheinz: *See*—
Spescha, Gelli; Martini, Karlheinz; and Sonderegger, Hans Conrad,3,640,130.

Martini, Richard W.: *See*—
Schwartz, Charles W.; and Martini, Richard W.,3,640,815.

Maruska, William O.: *See*—
Carlson, Donovan R.; and Maruska, William O.,3,640,225.

Maruyama, Isamu: *See*—
Yamamoto, Hisao; Kitagawa, Sumio; Inaba, Shigeho; Sakai, Shigeru; Hirohashi, Toshiyuki; Maruyama, Isamu; Akatsu, Mitsuhiro; and Izumi, Takahiro,3,641,002.

Maruyama, Tatsuo: *See*—
Sasaki, Hiroshi; Maruyama, Tatsuo; Kanzaki, Hisao; and Sakamoto, Yasuhiko,3,641,274.

Marvel, Carl S.; and Chow, Roberta C. L., to United States of America, Agriculture. Polymerization products of vinyl monomers and acrylate on vinyl ester terminated polyesters. 3,640,927, Cl. 260-23.

Maryland Cup Corporation: *See*—
Dill, Harry L.; and Collins, Richard D., 3,640,243.

Marz, Horst. Apparatus for the fluid treatment of thread or sheet-like material. 3,640,100, Cl. 68-150.

Masai, Yukito: *See*—
Hamanaka, Yasushi; Tajiri, Hiromi; Etoh, Kuniomi; Furukawa, Kaoru; and Masai, Yukito,3,640,761.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Ruhl, Rudolf, 3,640,639.

Maschinenfabrik Fahr Aktiengesellschaft: *See*—
Maier, Martin; and Wolf, Eberhard, 3,640,056.

Maschinenfabrik Lorenz AG: *See*—
Axtmann, Adam, 3,640,167.

Masco, Howard L., to Atlas Chemical Industries, Inc. Use of cesium as a stimulant in mammals. 3,641,242, Cl. 424-153.

Mason, Anthony, to Whirlpool Corporation. Filter condition indicator. 3,639,998, Cl. 34-82.

Mason, Frederick Percival; and Waren, Frank Arthur Oakley, to Creed & Company Limited. Magnetic powder applicator. 3,640,247, Cl. 118-637.

Mason, Jerry E.: *See*—
Narayana, Munisamappa; Keskkula, Henno; and Mason, Jerry E.,3,641,212.

Mason, John W.: *See*—
Castrucci, Paul P.; Gates, Harlan R.; Henle, Robert A.; Pricer, Wilbur David; Morton, Robert M.; Mason, John W.; and North, William D.,3,641,516.

Massachusetts Institute of Technology: *See*—
Cox, Duncan B., Jr.; and Fertig, Kenneth, 3,641,429.

Massie, Philip E. Axial gear train. 3,640,154, Cl. 74-800.

Massoud, Joseph T.: *See*—
Mifflin, Ralph W.; Wheeler, Joseph P.; and Massoud, Joseph T.,3,641,433.

Masters, Joan Irene: *See*—
Bishop, Nigel Douglas; and Masters, Joan Irene,3,641,035.

Mathers, James E.: *See*—
Ferri, John L.; and Mathers, James E.,3,639,932.

Matix Corporation, The: *See*—
Schleich, Nicholas P., 3,640,480.

Matovich, Edwin, to North American Rockwell Corporation. Method and means for achieving chemical equilibrium in a sealed-off co laser. 3,641,455, Cl. 331-94.5

Matsuhita Electric Industrial Co., Ltd.: *See*—
Tanaka, Heiroku, 3,641,292.

Matsui, Katsuaki: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Matsui, Katsuaki; Kuramada, Tomoyuki; Watanabe, Ichiro; and Ohta, Noriyuki,3,640,928.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kawamata, Tadashi; Hirota, Eiichi; Mihara, Toshihiro; and Terada, Yukio, 3,640,871.
Kosaka, Masahiro; and Fujita, Tadamasa, 3,641,507.
Nishida, Masamitsu; and Ouchi, Hiromu, 3,640,866.
Okamoto, Kenya; and Satoda, Hajime, 3,640,673.
Osugi, Kinichiro; Suzuki, Yoshiaki; Mori, Tokio; and Inamoto, Toshiharu, 3,641,561.

Matsushita Electronics Corporation: *See*—
Tagawa, Hazime, 3,641,383.

Matter, Erich, to Ciba Limited. Process for the manufacture of arylоxazoles. 3,641,044, Cl. 260-307.

Mattes, Heinz Otto: *See*—
Querfeld, Hermann; Mattes, Heinz Otto; and Flesch, Friedrich,3,640,043.

Matthews, Albert John: *See*—
Ball, Alan; Hayes, Barry James; and Matthews, Albert John,3,641,195.

Mattix, Rodney D.: *See*—
Kemmer, Frank N.; Robertson, Reid S.; and Mattix, Rodney D.,3,640,820.

Mattox, John R.; and Mattox, Thomas W. Locking device for tire retreading mold. 3,640,652, Cl. 425-20.

Mattox, Thomas W.: *See*—
Mattox, John R.; and Mattox, Thomas W.,3,640,652.

Matzner, Markus, to Union Carbide Corporation. Block copolycarbonates containing polylactone blocks and dihydric phenol polycarbonate blocks. 3,641,200, Cl. 260-860.

Mauldin, John H. Road roller. 3,640,192, Cl. 94-50.

Maurer, Hans W.: *See*—
Touzinsky, Gerald F.; and Maurer, Hans W.,3,640,925.

Mautz Paint & Varnish Company: *See*—
Stewart, Dair J., 3,640,889.

Max Corporation: *See*—
Itagaki, Kenichi, 3,640,443.

May, Russell R., Jr.: *See*—
Dietz, Albert; Goodspeed, Neil C.; and May, Russell R., Jr.,3,640,744.

Mayer, Kurt: *See*—
Sturm, Hans-Jurgen; and Mayer, Kurt,3,640,996.

Mayer, William N., to Control Data Corporation. Display faceplate switch. 3,641,299, Cl. 200-167.

Maytag Company, The: *See*—
Smith, Thomas R., 3,641,231.

McAdams, Hugh P., Jr., to Litton Precision Products, Inc. Fault monitor for use within a synchro torque system. 3,641,532, Cl. 340-198.

McAndrew, France B.; Polly, George W.; and Heinz, Walter E., to Celanese Corporation. Process for the production of oxymethylene copolymers. 3,641,192, Cl. 260-823.

McCarty, Orin P., to General Electric Company. Monitor circuit for vacuum type electric circuit interrupter. 3,641,359, Cl. 307-136.

McCaughey, Dennis G.: *See*—
Farnsworth, Robert P.; and McCaughey, Dennis G.,3,641,422.

Mc Clellan, William; and Stiles, Alvin B., to Du Pont de Nemours, E. I., and Company. Heat treated bismuth molybdate and phosphomolybdate-on-titania catalysts. 3,640,900, Cl. 252-437.

McComas, Charles C.: *See*—
Winfree, Jules P.; Todd, Herbert E.; and McComas, Charles C.,3,640,778.

Mc Cormick, Andrew, to United Kingdom Atomic Energy Authority. Gas chromatography-mass spectrometry. 3,641,339, Cl. 250-41.9

McCulloch Corporation: *See*—
Henry, Charles Frederick, 3,640,365.

McCurley, Jack: *See*—
Koch, Werner G.; and McCurley, Jack,3,640,183.

McDonald Edward Harvey; and Banks, William P., to Continental Oil Company. Cathodic process for the preparation of tetraalkyl lead compounds. 3,640,802, Cl. 204-72.

McDonald, Leighton S.: *See*—
Crabb, Clarence R.; and McDonald, Leighton S.,3,641,169.

McDonnell Douglas Corporation: *See*—
Rapsilber, William E.; and Koenig, Richard G., 3,639,989.
Sherman, Gale K., 3,639,948.

McDonough, William H.: *See*—
Ivers, Richard J.; and McDonough, William H.,3,641,565.

McFarlane, William: *See*—
Ammerman, George Edward; and McFarlane, William,3,641,312.

McGill, Robert L., Jr.: *See*—
Green, Norman; Greenhouse, Harold M.; Vergara, William C.; and McGill, Robert L., Jr.,3,641,372.

McGuire, John V., to Xerox Corporation. Combination controller-label form for article labeling systems. 3,641,319, Cl. 235-61.12

McGuire, William L., to Bauer, Eddie, Inc., mesne. Sleeping bags. 3,639,931, Cl. 5-343.

McGurty, James August: *See*—
Robertshaw, Fred C.; Bartos, Jon .; Hurst, James J.; and McGurty, James August,3,640,704.

McInnis, Andrew M.; Ballard, Louis M.; Rogers, Waldo I.; Kramer, David C.; and Nielsen, Robert A., to California Computer Products, Inc., mesne. Drafting table and method of producing same. 3,639,990, Cl. 33-18.

McJones, Robert W. Use of the heat of vaporization of a fuel as an air conditioning medium for a vehicle. 3,640,337, Cl. 165-23.

McKee, Clyde M.: *See*—
McKee, Clyde M.; Provenzino, Andrew V.; and Scott, Ward, 3,640,608.
McKee, Clyde M.; Provenzino, Andrew V.; and Scott, Ward, 3,640,609.

McKee, Clyde M.; Provenzino, Andrew V., and Scott, Ward, 1/3 to McKee, Clyde M., 1/3 to Scott, Ward, and 1/3 to Shapiro, Sandor. Automatically controlled mirror. 3,640,608, Cl. 350-307.

McKee, Clyde M.; Provenzino, Andrew V.; and Scott, Ward, 1/3 to McKee, Clyde M., 1/3 to Scott, Ward, and 1/3 to Shapiro, Sandor, mesne. Automatically controlled mirror. 3,640,609, Cl. 350-307.

McKee, James R.; and Chastain, James K., to Ball Corporation. Building structure. 3,640,039, Cl. 52-281.

McKee, Lewis W.; and Feest, Robert H., Jr., to Borden Corporation, The. Double row bearing. 3,640,593, Cl. 308-196.

McKee, William E.: *See—*
Field, Lester M.; Walker, Richard A.; and McKee, William E.,3,640,712.

McKiearnan, Charles J.: *See—*
Braddick, Britt O.; Lindsey, Hiram E., Jr.; and McKiearnan, Charles J.,3,640,341.

McKillip, William J.: *See—*
Culbertson, Billy M.; McKillip, William J.; and Sedor, Edward A.,3,641,145.

McKillip, William J.; Culbertson, Billy M.; and Impola, Clarence N., to Ashland Oil, Inc. Process for shrinkproofing wool. 3,640,676, Cl. 8-127.6

McLain, Aubrey R.: *See—*
Bolt, Gregory L.; Brandt, Charles H.; McLain, Aubrey R.; and Patel, Jayantilal M.,3,640,726.

McLaughlin, Ernest O.: *See—*
Fellers, John F.; Hinsch, James E.; and McLaughlin, Ernest O.,3,641,210.

McLean, Ronald L., to Houdaille Industries, Inc. Vibration dampers utilizing reinforced viscoelastic fluids. 3,640,149, Cl. 74-574.

McMullen, James Michael: *See—*
Fleming, John W., Jr.; and McMullen, James Michael,3,640,162.

McNally, Francis X.; and Chiosi, Louis, to Westinghouse Electric Corporation. Electron beam bolometer. 3,641,353, Cl. 250-213.

McNulty, John G.: *See—*
Hay, Russell G.; McNulty, John G.; and Walsh, William L.,3,641,086.

Mead Corporation, The: *See—*
Wood, Prentice J., 3,640,448.
Wood, Prentice J., 3,640,563.

Mead Johnson & Company: *See—*
Corrigan, John R.; and Coates, William M., 3,641,058.

Means, John A., to Time, Incorporated. Tapered header flow system for paper-machine. 3,640,843, Cl. 162-343.

Measurex Corporation: *See—*
Dahlin, Erik B., 3,641,349.

Meckel, Walter: *See—*
Ott, Karl-Heinz; Schuster, Herbert; Meckel, Walter; Dinges, Karl; and Muller, Erwin,3,641,209.

Meek, William H., to Ferro Corporation. Hydroxy-phenyl oxadiazoles. 3,641,045, Cl. 260-307.

Meier, James L.: *See—*
Findley, Harold J.; and Meier, James L.,3,640,941.

Meilleroux, Jean-Louis: *See—*
Brun, Henri; and Meilleroux, Jean-Louis,3,641,426.

Meisaner, Joachim, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process and apparatus for the determination of stress-strain relationships of solids and viscous liquids, especially of materials in the viscoelastic state. 3,640,127, Cl. 73-95.5

Melikian, Gorken: *See—*
Biancardi, Frank R.; and Melikian, Gorken,3,641,453.

Mellen, Edward J., Jr.: *See—*
Loxley, Ted A.; Webb, John M.; and Barber, Walter G., 3,640,398.

Memhardt, Charles Rogers: *See—*
Bhatia, Surindar Kumar; and Memhardt, Charles Rogers,3,640,283.

Mercier, Jacques H. Locking ring for pressure vessel. 3,640,172, Cl. 85-8.8

Mercier, Jacques: *See—*
Colinet, Andre; Mercier, Jacques; and Pernoud, Claude,3,640,457.

Mercier, Julian J. Slump indicator. 3,640,121, Cl. 73-54.

Merck & Co., Inc.: *See—*
Firestone, Raymond A., 3,641,065.
Loeffler, Larry J., 3,641,128.
Loeffler, Larry J., 3,641,129.
Miller, Thomas W., 3,641,063.
Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L., 3,641,134.

Merck, E., A. G.: *See—*
Lettre, Hans; and Fitzgerald, Thomas J., 3,641,146.

Merck, E., Aktiengesellschaft: *See—*
Scharf, Hans-Dieter; Droste, Wilhelm; and Liebig, Rita, 3,641,057.

Merger, Franz: *See—*
Platz, Rolf; and Merger, Franz,3,641,117.
Platz, Rolf; and Merger, Franz,3,641,118.

Merlin Gerin Societe Anonyme: *See—*
Ferton, Jean-Yves; Hennebert, Jacques; and Strippoli, Francois, 3,641,295.

Merz, Adolf, to Merz AG Dulliken. Adjustable machine reamer. 3,640,637, Cl. 408-197.

Merz AG Dulliken: *See—*
Merz, Adolf, 3,640,637.

Messer, Mayer Naoum: *See—*
Farge, Daniel; Messer, Mayer Naoum; and Moutonnier, Claude,3,641,127.

Messina, Joseph F.; and Gisser, Henry, to United States of America, Army. Grease compositions. 3,640,859, Cl. 252-54.

Metaframe Corporation: *See—*
Willinger, Allan H., 3,640,302.
Willinger, Allan H., 3,640,516.

Metral, Jean-Pierre: *See—*
Coppen, Alec James; and Metral, Jean-Pierre,3,641,236.

Metz, Jack L., to Teletype Corporation. Electrostatic printer. 3,641,588, Cl. 346-75.

Metzger, Karl: *See—*
Heer, Alfred; and Metzger, Karl,3,641,064.

Metzger, Nelson D.: *See—*
Altherr, Russell G.; Shramovich, Paul F.; and Metzger, Nelson D.,3,640,402.

Metzger, Sidney H., Jr., to Mobay Chemical Company. Polyesterurethanes stabilized with imino-oxazines. 3,640,952, Cl. 260-45.8

Meyer, Pierre: *See—*
Gluntz, Claude; Meyer, Pierre; and Peyrot, Jean,3,640,982.

Meyfarth, Herbert J., and Crosby, John J., to Republic Steel Corporation. Coiling method and apparatus. 3,640,112, Cl. 72-138.

Meystre, Charles: *See—*
Anner, Georg; and Meystre, Charles,3,641,069.

Michals, Chester S.; and Motroni, Philip J., to Air Reduction Company, Incorporated. Machine for cutting slabs from ice blocks. 3,640,166, Cl. 83-201.

Michels, Aldred; and Bittscheidt, Josef, to Chemische Werke Huls Aktiengesellschaft. Foamed poly-1-butene. 3,640,919, Cl. 260-2.5

Michieli, Roy E. Triangularly shaped concrete seat with like covering. 3,640,041, Cl. 52-390.

Michigan Chemical Corporation: *See—*
Dalzell, Darwin Allen, 3,640,949.

Michigan Wheel Corporation: *See—*
Kress, Robert F.; and Lorenz, Eldon L., 3,640,642.

Middleton, Henry Edward: *See—*
Palfreyman, Jack; and Middleton, Henry Edward,3,640,640.

Midland Silicones Limited: *See—*
Bush, Richard P., 3,641,089.

Midland-Ross Corporation: *See—*
Gasior, Joseph; and Kovacs, Lloyd, 3,640,661.

Miesterfeld, Frederick O.: *See—*
Carp, Ralph W.; and Miesterfeld, Frederick O.,3,640,588.

Mifflin, Ralph W.; Wheeler, Joseph P.; and Massoud, Joseph T., to United States of America, Air Force. Transmitted reference synchronization system. 3,641,433, Cl. 325-8.

Mihara, Toshihiro: *See—*
Kawamata, Tadashi; Hirota, Eiichi; Mihara, Toshihiro; and Terada, Yukio,3,640,871.

Mikite, Gyula: *See—*
Rakoczi, Jozsef; Mikite, Gyula; Petocz, Lujza; Fischer, Janos; Grauser, Katalin; and Kosoczky, Ibolya,3,641,039.

Miles, Edwin R.; and Dreier, Donald E., to Northrop Corporation. Tire uniformity tester. 3,640,132, Cl. 74-146.

Miles Laboratories, Inc.: *See—*
Weiss, Margaret Rozman, 3,641,235.

Milkowski, Wolfgang; Stuhmer, Werner; and Von Eickstedt, Klaus-Wolf, to Kali-Chemie Aktiengesellschaft. 3-N-(2-hydroxy-3-phenoxypropyl)-amino-1- phenylpropanon-(1) and the salts thereof. 3,641,125, Cl. 260-501.18

Miller, Gary E. Humidity tent. 3,639,930, Cl. 5-330.

Miller, Harry T. Rotary hoe. 3,640,347, Cl. 172-349.

Miller, Paul E.: *See—*
Gates, John W., Jr.; Wise, Albert W.; Beavers, Dorothy J.; and Miller, Paul E.,3,641,046.

Miller, Thomas W., to Merck & Co., Inc. Antibiotic purification process. 3,641,063, Cl. 260-348.

Miller, Virgil A., to Atlantic Richfield Company. Lubricating composition and method for treating metal-mold interface in continuous casting operation. 3,640,860, Cl. 252-56.

Miller, Wendell S. Incremental recorder with common control of drive and recorder. 3,641,584, Cl. 346-74.

Miller, William A., to Allied Chemical Corporation. Polytetrafluoroethylene. 3,640,984, Cl. 260-92.1

Milligan, Gene E., to National Cash Register Company. Self-clocking five bit record-playback system. 3,641,525, Cl. 340-174.1

Mills, Truett P. Hose-less wooden golf club with shaft retainer and sole plate. 3,640,534, Cl. 273-80.7

Mills, Wallace R.: *See—*
Shmueli, Kalman; Scott, Robert T.; and Mills, Wallace R.,3,640,318.

Milner, Peter James; and Hodkin, Richard Keith, to Rootes Motors Limited. Vehicle wheel braking systems. 3,640,587, Cl. 303-21.

Mineshima, Yukihiko: *See—*
Kobayashi, Toshio; and Mineshima, Yukihiko,3,641,562.

Minhas, Pritam S.: *See—*
Anello, Louis G.; Boghosian, Edward Michael; Jones, Edward S.; Minhas, Pritam S.; Price, Alson K.; and Sweeney, Richard F.,3,641,083.

Minieri, Pasquale Paul, to Tenneco Chemicals, Inc. 1,5-Substituted indazoles. 3,641,050, Cl. 260-310.

Minkevich, Boris Iosifovich. Method of treating mineralized water. 3,640,695, Cl. 71-1.

Minnesota Mining and Manufacturing Company: *See—*
Conrad, Lawrence H., 3,640,607.
Elton, Robert L., 3,640,829.
Seppala, Harold J.; and Benz, Gerhard, 3,640,944.
Shevlin, Thomas S., 3,640,764.
Smith, George H., 3,640,718.

Minnesota Minning and Manufacturing Company: *See—*
Conrad, Lawrence H., 3,640,606.

Misek, Victor A.; and Myers, Robert, to Sanders Assoicates, Inc. Electro-optical perimeter intrusion alarm. 3,641,549, Cl. 340-258.

Mitchell, Paul J., Jr., to SW Industries, Inc. Paper manufacturing roll construction and process. 3,639,957, Cl. 29-120.

Mitchell, William Eric, to Dunlop Company Limited, The. Method of mounting a pneumatic tire on a deformable rim. 3,639,964, Cl. 29-159.01

Mite Corporation: *See—*
Wallace, Robert P., 3,640,655.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Ikeda, Hiroshi, 3,641,301.
Nakata, Josuke, 3,641,403.

Mitsubishi Petrochemical Company Limited: *See—*
Furukawa, Junji; and Morikawa, Hiroyuki, 3,641,187.

Mitsui Mining & Smelting Co., Ltd.: *See—*
Miyazaki, Kazuhide; and Tozawa, Seiichi, 3,640,683.

Mitsui Toatsu Chemicals, Inc.: *See—*
Konoki, Keizo; and Ohsaki, Kozo, 3,640,052.

Mittag, Hermann; and Issler, Jorg, to Bosch, Robert, G.m.b.H. Ignition arrangement for internal combustion engines. 3,640,260, Cl. 123-148.

Miyazaki, Kazuhide; and Tozawa, Seiichi, to Mitsui Mining & Smelting Co., Ltd. Method of preparing maganese dioxide for dry cell. 3,640,683, Cl. 23-145.

Mizuno, Akinori: *See—*
Okuno, Zenjiro; Mizuno, Akinori; and Kondoh, Ikuyo,3,640,863.

Mizuno, Hiroshi: *See—*
Ohshima, Haruhiko; Mizuno, Hiroshi; Konno, Akira; and Kosaka, Tomoaki,3,641,270.

Mizuno, Miyoji. Tooth-cleaning tool. 3,640,291, Cl. 132-84.

Mizusawa, Frank S.: *See—*
Carroll, William J.; and Mizusawa, Frank S.,3,640,234.

M&J Valve Company: *See—*
Grove, Marvin H.; Kim, Kee W.; and Van Arsdale, Lyle R., 3,641,542.

Mobay Chemical Company: *See—*
Metzger, Sidney H., Jr., 3,640,952.

Mobil Oil Corporation: *See—*
Broderick, Edward J.; and Rein, Burton M., 3,641,120.
Kemp, Robert T., 3,641,052.
Kokotailo, George T.; and Lawton, Stephen L., 3,640,680.
Napier, Roger P.; and Pirnik, Michael P., 3,641,061.
Wilson, Robert C., Jr., 3,640,905.

Mobil Oil Corporation: *See—*
Gemmill, Robert M., Jr.; Schick, John W.; and Mobil Oil Corporation,3,640,870.

Moffatt, John G., to Syntex Corporation. Sulfonium ylids of active methylene compounds. 3,641,055, Cl. 260-332.3

Mohrlok, Sharon R., to Dow Corning Corporation. Cosmetic wax composition. 3,641,239, Cl. 424-64.

Moisescu, Gheorghe; Stoica, Valer; Wolf, Carol; and Spataru, Nicolae, to Institutul de Cercetari Si Proiectari Alimentare. Process and plant for fast conditioning or thermal treatment of bread cereals, especially wheat. 3,640,206, Cl. 99-237.

Moll, Farnz: *See—*
Von Konig, Anita; Moll, Farnz; Muller-Bardorff, Wolfgang; and Saleck, Wilhelm,3,640,719.

Moll, Franz: *See—*
Huckstadt, Harald; Saleck, Wilhelm; Randolph, August; Moll, Franz; and Ranz, Erwin,3,640,715.

Moller, Aage; and Straarup, Orla, to Aktieselskabet Niro Atomizer. Atomizer wheel with wear-resistant, sintered bushings. 3,640,467, Cl. 239-224.

Molybdenum Corporation: *See—*
Trimble, Carter H.; and Strott, David B., 3,640,678.

Molybdenum Corporation of America: *See—*
Erhard, Albert E.; and Allison, Jack B., 3,640,679.

Monroe, Roger A.: *See—*
Campbell, Ronald R.; and Monroe, Roger A.,3,641,277.

Monsanto Chemicals Limited: *See—*
Ayad, Karl, 3,641,042.

Monsanto Company: *See—*
Boustany, Kamel, 3,640,976.
Jope, Bruce T.; and Phillips, Alan R., 3,640,666.
Reilly, Joseph R., 3,640,671.
Schnur, Joel M., 3,640,932.
Yancik, Joseph J.; Schulze, Roy E.; and Rydlund, Paul H., 3,640,784.

Monser, George J., to Raytheon Company. Fractional turn helical antenna. 3,641,580, Cl. 343-895.

Montanari, Lucio: *See—*
Brescia, Riccardo; and Montanari, Lucio,3,641,568.

Montecatini Edison S.p.A.: *See—*
Bonvicini, Alberto; and Cantatore, Giuseppe, 3,640,999.

Monti, Giancarlo, to Siai-Marchetti S.p.A. Helicopter rotor construction. 3,640,643, Cl. 416-136.

Moore Products Co.: *See—*
Adams, Robert B., 3,640,133.

Moore, Robert E.; and Janoski, Edward J., to Sun Oil Company. Highly fluorinated alkyladamantanes. 3,641,167, Cl. 260-648.

Moran, John B.: *See—*
Schneider, John A.; and Moran, John B.,3,640,857.

Moreuil, Jean-Louis: *See—*
Braillard, Pierre L.; Moreuil, Jean-Louis; and Steru, Marius,3,640,002.

Morgenroth, Henri. Meteringrod carburetor. 3,640,512, Cl. 261-34.

Mori, Masato: *See—*
Nagata, Masanori; and Mori, Masato,3,641,315.

Mori, Tokio: *See—*
Osugi, Kinichiro; Suzuki, Yoshiaki; Mori, Tokio; and Inamoto, Toshiharu,3,641,561.

Mori, Yoichi; and Ichimura, Hiroshisa, to Nissan Motor Company, Limited. Control system for automotive automatic transmission. 3,640,156, Cl. 74-866.

Morikawa, Hiroyuki: *See—*
Furukawa, Junji; and Morikawa, Hiroyuki,3,641,187.

Morimura, Syoji: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Matsui, Katsuaki; Kuramada, Tomoyuki; Watanabe, Ichiro; and Ohta, Noriyuki,3,640,928.

Morris, Earl L. Soap dispensing metering pressure valve. 3,640,435, Cl. 222-335.

Morris, Hugh C.: *See—*
Clark, Richard B.; Morris, Hugh C.; and Whitehurst, Gerald E.,3,640,359.

Morrison, Andrew Ivar; and Hannah, Bruce R., to Art Metal-Knoll Corporation. Furniture construction. 3,640,576, Cl. 297-440.

Morse, John E.; and Rosenburgh, Norman J., to Eastman Kodak Company. Web handling apparatus. 3,640,438, Cl. 226-25.

Morton, Robert M.: *See—*
Castrucci, Paul P.; Gates, Harlan R.; Henle, Robert A.; Pricer, Wilbur David; Morton, Robert M.; Mason, John W.; and North, William D.,3,641,516.

Moschel, Albrecht, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Polyester polycondensation process under decreasing temperatures. 3,640,962, Cl. 260-75.

Motorola, Inc.: *See—*
Gunn, David L.; and Hanus, George M., 3,641,441.
Hollingsworth, Gale C.; and Steffel, Ronald V., 3,641,451.
Lunn, Gerald K., 3,641,450.
Munn, Robert J., 3,641,435.
Nation, Melvin S., 3,641,395.
Riff, James A., 3,641,416.
Sanera, Arthur E., 3,640,197.

Motroni, Philip J.: *See—*
Michals, Chester S.; and Motroni, Philip J.,3,640,166.

Mott, Ralph B., Jr.: *See—*
Mott, Ralph B., Sr.; Mott, Ralph B., Jr.; and Cantella, Richard C.,3,639,944.

Mott, Ralph B., Sr.; Mott, Ralph B., Jr.; and Cantella, Richard C., said Cantella assor. to Reserv-A-Roll Co., partnership composed of Mott, Ralph Beach, Sr., and Mott, Ralph Beach, Jr. Hinge arrangement including a partially concealed means for securing with a swinging door. 3,639,944, Cl. 16-153.

Mott, Ralph Beach, Jr.: *See—*
Mott, Ralph B., Sr.; Mott, Ralph B., Jr.; and Cantella, Richard C., 3,639,944.

Mourier, Emile, to Rhone-Poulenc S. A. Purification of dehydrolinalool by fractional distillation and water washing. 3,640,851, Cl. 203-42.

Moussalli, Francis Selim, to Celanese Corporation. Procedure for dry cleaning. 3,640,881, Cl. 252-171.

Moutonnier, Claude: *See—*
Farge, Daniel; Messer, Mayer Naoum; and Moutonnier, Claude,3,641,127.

Mowat, Keith B.; and Heyn, William O., to Chicago Rawhide Manufacturing Co. Oil seal with pumping action. 3,640,542, Cl. 277-134.

Moyer, Rudolph H.: *See—*
Anderson, Howard H.; Moyer, Rudolph H.; Sibbett, Donald J.; and Sutherland, David C.,3,640,624.

Moyer, William H., to Eaton Yale & Towne, Inc. Torque-transmitting device. 3,641,375, Cl. 310-105.

Mrozek, Pawel K., to RCA Corporation. Temperature compensated crystal oscillator. 3,641,461, Cl. 331-116.

M&T Chemicals Inc.: *See—*
Gloskey, Carl Robert, 3,640,947.

Mueller, William J.: *See—*
Farnham, Norman W.; Mueller, William J.; and Gorall, Donald J.,3,640,219.

Muench, Paul W.: *See—*
Hopkins, Neil E.; and Muench, Paul W.,3,640,084.

Muhlhausen, Cornelius: *See—*
Konig, Klaus; Muller, Erwin; Kallert, Wilhelm; and Muhlhausen, Cornelius,3,640,967.

Mukai, Toshihiko: *See—*
Nakanishi, Michio; Kobayashi, Ryosuke; Abe, Kozo; and Mukai, Toshihiko,3,641,060.

Mullen, Joseph F., to Combustion Engineering, Inc. High moisture content fuel dispersion apparatus. 3,640,232, Cl. 110-7.

Muller, Curt G. Fastener means. 3,640,173, Cl. 85-8.8

Muller, Ernst Willi: *See—*
Wilke, Gunther; and Muller, Ernst Willi,3,641,175.
Muller, Erwin: *See—*
Konig, Klaus; Muller, Erwin; Kallert, Wilhelm; and Muhlhausen, Cornelius,3,640,967.
Ott, Karl-Heinz; Schuster, Herbert; Meckel, Walter; Dinges, Karl; and Muller, Erwin,3,641,209.
Muller, Jurgen: *See—*
Waschk, Fritz; Muller, Jurgen; Krieger, Heinrich; and Heindrich, Gunter,3,640,205.
Muller, Richard; Frey, Hans; and Dathe, Christian, to Institut fur Silikon-und Fluorkarbon-Chemie. Process for the alkylation, alkenylation or arylation of heavy-metal salts by means of organo- triptych-siloxazolidines. 3,641,082, Cl. 260-431.
Muller-Bardorff, Wolfgang: *See—*
Von Konig, Anita; Moll, Farnz; Muller-Bardorff, Wolfgang; and Saleck, Wilhelm,3,640,719.
Mullin, William F., to Mallory, P. R., & Co., Inc. Multiple-condition automotive alarm system. 3,641,488, Cl. 340-52.
Munch, Josef, to Bock, Otto, Orthopadische Industrie KG., Firma. Mattress for invalids. 3,639,927, Cl. 5-91.
Mundus, Friedhelm, to Windmoller & Holscher. Bag-making machines for making plastics side-fold bags with carrier handles. 3,640,187, Cl. 93-8.
Munn, Robert J., to Motorola, Inc. Television frequency stabilizing system. 3,641,435, Cl. 325-63.
Munson, Donald J., to North Central Manufacturing Corporation. Foldable ironing board. 3,640,230, Cl. 108-63.
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Matsui, Katsuaki; Kuramada, Tomoyuki; Watanabe, Ichiro; and Ohta, Noriyuki, to Sankyo Company Limited. Stabilization of synthetic polymers. 3,640,928, Cl. 260-23.
Murphey, Daniel F.: *See—*
Gendler, Irvin F., 3,640,535.
Murphree, Francis J.; and Marrero, Michael T., to United States of America, Navy. Echo simulation means. 3,641,485, Cl. 340-3.
Murphy, Charles F., Webber, J Alan; Kaiser, Gary V.; Van Heyningen, Earle M.; Wright, Ian G.; and Cooper, Robin D. G., to Lilly, Eli, and Company. Reduction of Δ_3-cephalosporin sulfoxides. 3,641,014, Cl. 260-243.
Murphy, Clarence R.: *See—*
Cupples, Barrett L.; and Murphy, Clarence R.,3,640,852.
Murphy, Frank W., *Jr.*: *See—*
Murphy, Frank W.; and Murphy, Frank W., Jr.,3,641,290.
Murphy, Frank W.; and Murphy, Frank W., *Jr.* Vibration responsive switch. 3,641,290, Cl. 200-61.45
Murphy, Kevin P.: *See—*
Orfeo, Sabatino R.; and Murphy, Kevin P.,3,640,869.
Murray, Louis Daniel. Projection screens. 3,640,601, Cl. 350-117.
Murray, Maxwell John: *See—*
Tauber, Elisha; and Murray, Maxwell John,3,640,754.
Muse, George H.; and Keane, Peter J., to Erie Tool Works. Pipe cutter. 3,639,980, Cl. 30-102.
Musso, Pietro: *See—*
Cortona, Alessandro; Musso, Pietro; Saltini, Fabrizio; and Fiorenza, Giorgio,3,641,317.
Mutrux, Jean L. Amphibious helicopter type aircraft. 3,640,485, Cl. 244-12.
Myers, Herman A. Ratchet-like wrench. 3,640,158, Cl. 81-583.
Myers, Robert: *See—*
Misek, Victor A.; and Myers, Robert,3,641,549.
Nabisco, Inc.: *See—*
Ronai, Kenneth S.; and Spanier, Henry C., 3,640,728.
Ronai, Kenneth S.; and Spanier, Henry C., 3,640,729.
Nagae, Tadashi; Oishi, Yasushi; and Hayashi, Jun, to Fuji Photo Film Co., Ltd. Method of preventing color mixing in multi- layer-type reversal color photographic light- sensitive materials. 3,640,716, Cl. 96-56.
Nagai, Hiroshi: *See—*
Suzuki, Shigeyuki; Kaneda, Isamu; Takahashi, Masaaki; and Nagai, Hiroshi,3,640,969.
Nagai, Shigeki: *See—*
Yamada, Keisho; Nagai, Shigeki; Odan, Kyoji; Nakamura, Yasuo, and Hidaka, Mijio,3,641,100.
Yamada, Keisho; Nagai, Shigeki; Odan, Kyoji, Arima, Yasutaka; and Hidaka, Mikio,3,641,101.
Nagata, Koichiro: *See—*
Ito, Tomiyasu.; Nagata, Koichiro; Ichikawa, Takehiko; and Kato, Tetsuya,3,641,003.
Nagata, Masanori; and Mori, Masato, to Omron Tateisi Electronics Co. System for automatically conducting office work required for transactions at a bank and the like. 3,641,315, Cl. 235-61.7
Nagy, Michael J.: *See—*
Buller, Joseph S.; Nagy, Michael J.; and Peterson, Eugene W.,3,640,091.
Nakamaye, Kay L.; Slaugh, Lynn H.; Spooncer, William W.; and Volger, Hendrik C., to Shell Oil Company. Ethylene telomerization. 3,641,170, Cl. 260-658.
Nakamura, Michiei: *See—*
Horiguchi, Shojiro; and Nakamura, Michiei,3,640,983.
Nakamura, Seiichi: *See—*
Ito, Hiroo; Nakamura, Seiichi; and Inoue, Hidemu,3,640,902.
Nakamura, Tadashi, to Ise Electronics Corporation. Solid state letter display device. 3,641,390, Cl. 315-169.
Nakamura, Yasuo: *See—*
Yamada, Keisho; Nagai, Shigeki; Odan, Kyoji; Nakamura, Yasuo; and Hidaka, Mijio,3,641,100.
Nakanishi, Michio; Kobayashi, Ryosuke; Abe, Kozo; and Mukai, Toshihiko, to Yoshitomi Pharmaceutical Industries, Ltd. Carbamate insecticide. 3,641,060, Cl. 260-340.7
Nakano, Kinichi: *See—*
Uzu, Keizo; Nakano, Kinichi; and Takahashi, Toshinaka,3,641,053.
Nakata, Josuke, to Mitsubishi Denki Kabushiki Kaisha. Thyristor with degenerate semiconductive region. 3,641,403, Cl. 317-235.
Nakazawa, Yosh, & Associates, Inc.: *See—*
Nakazawa, Yoshio; and Lipper, Harold A., 3,640,036.
Nakazawa, Yoshio; and Lipper, Harold A., to Nakazawa, Yosh, & Associates, Inc. Architectural system of interior modular construction. 3,640,036, Cl. 52-126.
Nalbandian, Robert M.: *See—*
Hymes, Alan C.; Margulis, Rajko R.; and Nalbandian, Robert M.,3,641,240.
Nalco Chemical Company: *See—*
Jursich, Myron J.; and Ciesla, Stanley F., 3,640,766.
Kekish, George T.; James, William G.; and Simons, Duane J., 3,640,933.
Kemmer, Frank N.; Robertson, Reid S.; and Mattix, Rodney D., 3,640,820.
Sampson, Ronald G., 3,640,894.
Napier, Roger P.; and Pirnik, Michael P., to Mobil Oil Corporation. Substituted mercuri cyclohexyl compounds. 3,641,061, Cl. 260-340.9
Narayana, Munisamappa; Keskkula, Henno; and Mason, Jerry E., to Dow Chemical Company, The. High impact strength styrene-maleic anhydride compositions. 3,641,212, Cl. 260-893.
Narda Microwave Corporation, The: *See—*
Aslan, Edward E., 3,641,439.
Narken, Bernt: *See—*
Hoogendoorn, Helen M.; Liberman, Herbert E.; Narken, Bernt; and Sunners, Brian,3,639,976.
Nathansohn, Giangiacomo; Odasso, Gianfranco; De Ruggieri; and Guzzi, Umberto, to Gruppo Lepetit S.p.A. Unsaturated pregna-3,20-dione-(17a, 16a-d) oxazalines. 3,641,007, Cl.
Nathe, Raymond J.: *See—*
Fitchman, Arthur E.; and Nathe, Raymond J.,3,640,775.
Nation, Melvin S., to Motorola, Inc. Apparatus for quickly mounting and electrically connecting components in a housing with camming connector arrangement. 3,641,395, Cl. 317-117.
National Cash Register Company: *See—*
Milligan, Gene E., 3,641,525.
National Cash Register Company, The: *See—*
Lin, Chao-Han; and Wright, Arthur J., 3,641,011.
Purcell, Antoinette M., 3,640,892.
National Distillers and Chemical Corporation: *See—*
Baba, Theodore B., 3,640,980.
National Lead Company: *See—*
Love, Frank E., 3,640,801.
National Patent Development Corporation: *See—*
Gould, Francis E.; and Shepherd, Thomas H., 3,641,237.
National Research Development Corporation: *See—*
Coackley, Robert; Reynolds, Michael Leslie; and Rodgers, Clive Douglas, 3,641,345.
Ibbett, Roland Norman; and Aspinall, David, 3,640,625.
Te'Eni, Moshe, 3,640,126.
National Water Main Cleaning Co.: *See—*
Primus, Norman S.; and Hunhoff, Raymond, 3,640,759.
Navin, William R., *Jr.*: *See—*
White, Donald J.; and Navin, William R., Jr.,3,641,484.
Naylor, Floyd E., to Phillips Petroleum Company. Reaction product of hydrocarbylmonolithium and 1,3-butadiene as polymerization initiator. 3,640,899, Cl. 252-431.
Naylor, Floyd E., to Phillips Petroleum Company. Termination of diene polymerization. 3,640,990, Cl. 260-94.7
Neal, David Patrick John: *See—*
Love, Dennis Anthony; Neal, David Patrick John; and Pidgeon, Eric,3,641,001.
Neal, Francis John; Courtenay, Jerzy Leon, and Simmons, John Richard, to Hobson, H. M., Limited. Torque limiter. 3,640,092, Cl. 64-28.
Neal, William J., to Shell Oil Company. Method and apparatus for connecting a flowline to an offshore installation. 3,640,080, Cl. 61-72.3
Neeley, Victor L; and Libby, Hugo L., to Holotron Corporation. Technique of holography by source scanning. 3,640,598, Cl. 350-3.5
Neff, Charles G.; and Carrier, Louis V., to Holland Hitch Company. Non-squirt fifth wheel assembly. 3,640,549, Cl. 280-435.
Neller, William C.: *See—*
Jenkins, Peter J.; and Neller, William C.,3,640,371.
Nelson, Carl W., *Jr.* Unambiguous digital processing of dual binary three-valued codes. 3,641,327, Cl. 235-155.
Nelson, John; and Stoppard, William E., to Leesona Corporation. Strand handling. 3,640,160, Cl. 83-24.
Nelson, Norman A., to ACF Industries, Incorporated. Subsea wellhead control system. 3,640,299, Cl. 137-1.
Nemiroff, Robert V., to Eaton Yale & Towne, Inc. Dynamic automatic braking for truck. 3,641,411, Cl. 318-373.
Neptune Microfloc, Incorporated: *See—*
Conley, Walter R.; and Culp, Gordon L., 3,640,387.

Nerenberg, Samuel T. Adapter for a macromolecule separation device. 3,640,813, Cl. 204-299.

Neumaier, Hubert: *See*—
Sennewald, Kurt; Ohorodnik, Alexander; and Neumaier, Hubert,3,641,164.

Neumann, Friedmund: *See*—
Engelfried, Otto; Neumann, Friedmund; and Wiechert, Rudolf,3,641,013.

Newstein, Maurice C.: *See*—
La Tourrette, James T.; Newstein, Maurice C.; and Rabinowitz, Paul J.,3,641,458.

Nichols, George E., Jr., to Bird Machine Company. Coated screens. 3,640,760, Cl. 117-99.

Nicolay, Karl, to Durkoppwerke GmbH. Thread retainer for sewing machines. 3,640,236, Cl. 112-243.

Niederhauser, Warren Dexter; Belmares-Sarabia, Hector; and Bauer, William, Jr., to Rohm and Haas Company. Urethane elastomer with active hydrogen containing monoethylenically unsaturated monomer. 3,641,199, Cl. 260-859.

Niedl, Georg. Impeller for heavy duty comminuting pumps. 3,640,474, Cl. 241-46.02

Nielander, William B., to Xerox Corporation. Electrostatic magnetic developing apparatus. 3,640, 348, Cl. 118-637.

Nielsen, Robert A.: *See*—
McInnis, Andrew M.; Ballard, Louis M.; Rogers, Waldo I.; Kramer, David C.; and Nielsen, Robert A.,3,639,990.

Nieminski, Robert A.: *See*—
Wahl, James A.; and Nieminski, Robert A.,3,640,415.

Nihof, Hendrikus J.; and Borsboom, Albertus C. H., to Shell Oil Company. Method and apparatus for detecting an interface between two liquids in a pipeline. 3,640,120, Cl. 73-53.

Nippon Dense Company Limited: *See*—
Kawai, Hisashi, 3,641,490.

Nippon Denso Kabushiki Kaisha: *See*—
Shirai, Takeaki; Sakakibara, Shigeru; Noguchi, Masaaki; and Sumiyoshi, Masaharu, 3,640,152.
Taniguchi, Koichi, 3,640,589.
Yamaguchi, Terumoto, 3,640,165.

Nippon Electric Co., Ltd.: *See*—
Oikado, Taizo, 3,641,385.

Nippon Electric Company Limited: *See*—
Kiji, Kazuo, 3,641,495.

Nippon Kogaku K.K.: *See*—
Kimura, Shuji, 3,640,201.

Nippon Kokan Kabushiki Kaisha: *See*—
Arimura, Tohru; Kamata, Masamoto; Okado, Masaru; and Ichimaru, Takarokuro, 3,641,325.

Nippon Telegraph and Telephone Public Corporation: *See*—
Watanabe, Yoshio; and Sakai, Tetsushi, 3,640,806.

Nippondenso Kabushiki Kaisha: *See*—
Fujii, Minoru, 3,641,377.
Sumiyoshi, Masaharu; Sakakibara, Shigeru; Ito, Osamu; and Kato, Takaaki, 3,640,151.

Nippondenso Kabushiki Kaishi: *See*—
Sato, Suguru, 3,641,374.

Nishida, Masamitsu; and Ouchi, Hiromu, to Matsushita Electric Industrial Co., Ltd. Piezoelectric ceramic compositions. 3,640,866, Cl. 252-62.

Nishina, Yoshio: *See*—
Ishihara, Masao; Sugino, Osakazu; Nishina, Yoshio; Kohno, Isao; and Satoh, Yuzuru,3,640,721.

Nissan Motor Company, Limited: *See*—
Mori, Yoichi; and Ichimura, Hiroshisa, 3,640,156.

Nitro Nobel AB: *See*—
Olsson, Per O. I., 3,640,223.

Nitz, Allen R., to Allis-Chalmers Manufacturing Company. Electrical contact. 3,641,300, Cl. 200-166.

Noble, Lowell A., to Varian Associates, mesne. Method of producing neutron source tube with coated target. 3,640,597, Cl. 316-10.

Noble Manufacturing Company: *See*—
Sosalla, Harry, 3,640,345.

Noetinger, Philippe J., to Compagnie Generale d'Automatisme. Automatic sorting device. 3,640,367, Cl. 193-31.

Nogiwa, Yasuo: *See*—
Kubo, Moritada; Shigehara, Masamichi; and Nogiwa, Yasuo,3,641,347.

Noguchi, Masaaki: *See*—
Shirai, Takeaki; Sakakibara, Shigeru; Noguchi, Masaaki; and Sumiyoshi, Masaharu,3,640,152.

Nolken, Ernst, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Cellular plastics of epoxy resins and process for their manufacture. 3,640,917, Cl. 260-2.5

Nolte, Claude B., to Kingmann-White, Inc. Mass flow rate meter. 3,640,136, Cl. 73-228.

Noltes, Jan Gerrit: *See*—
Overmars, Henricus Gerardus Josef; Van Elven, Aris; and Noltes, Jan Gerrit,3,641,178.

Nomura, Katsuhiko, to Asahi Kogaku Kogyo Kabushiki Kaisha. Single lens reflex camera. 3,640,202, Cl. 95-42.

Nord, Eric T.: *See*—
Hogstrom, Edwin F.; Stumphauzer, William C.; and Nord, Eric T.,3,640,758.

Nordholm, Lloyd P.: *See*—
Florance, Douglas A.; Nordholm, Lloyd P.; and Foldes, Stephen,3,641,393.

Nordson Corporation: *See*—
Hogstrom, Edwin F.; Stumphauzer, William C.; and Nord, Eric T., 3,640,758.

Norris, Kermit A., to Leach Corporation, mesne. Magnetic record and reproduce system for digital data having a NRZC format. 3,641,524, Cl. 340-174.1

North American Rockwell Corporation: *See*—
Anastasio, Frank J.; Brundage, Clinton F.; and Strakosch, Clarence P., 3,640,407.
Fujimoto, Ted Y., 3,641,366.
Heimbigner, Gary Lee, 3,641,370.
Hughes, Roland O.; and Allen, Joseph H., 3,641,323.
Matovich, Edwin, 3,641,455.
Shaheen, Joseph M.; and Simone, John, 3,641,520.
Waner, Donald W.; Litzell, John E.; and Olsen, Roger F., 3,640,155.

North Central Manufacturing Corporation: *See*—
Munson, Donald J., 3,640,230.

North, William D.: *See*—
Castrucci, Paul P.; Gates, Harlan R.; Henle, Robert A.; Pricer, Wilbur David; Morton, Robert M.; Mason, John W.; and North, William D.,3,641,516.

Northrop Corporation: *See*—
Miles, Edwin R.; and Dreier, Donald E., 3,640,132.
Star, Moe, 3,640,492.

Norton Company: *See*—
Kiovsky, Joseph R.; and Bart, Ronald K., 3,641,095.

Nothmann, Gerhard A.: *See*—
Florsheim, Leonard S., Jr.; Lieberman, David A.; Archer, Harold B.; and Nothmann, Gerhard A.,3,640,623.

Nottingham, J. B., & Co., Inc.: *See*—
Savoca, Paul C.; and Marasco, Anthony D., 3,641,478.

Novack, Robert Lee: *See*—
Allen, Robert J.; and Novack, Robert Lee,3,640,773.

Nowensky, Cecil. Cutter for pizza pies and the like. 3,639,981, Cl. 30-114.

NRM Corporation: *See*—
Laenen, Nicholas M.; and Cooper, James M., 3,640,653.

NSU Motorenwerke Aktiengesellschaft: *See*—
Stephan, Gerhard; Harst, Heinz; Laux, Gunter; and Kappes, Alfred, 3,640,799.

Nupnau, Arthur E., to Bell & Howell Company. Automatic rewind for motion picture projectors. 3,640,612, Cl. 352-124.

Nupuf, Joseph S. Ophthalmometer device having target means independently adjustable while maintaining the corneal image in focus. 3,640,610, Cl. 351-13.

Nusbickel, Edward M., Jr., to Bethlehem Steel Corporation. Ultrasonic defect signal discriminator. 3,640,122, Cl. 73-679.

Nute, Ernest B., Jr.; and Ollinger, James C., to Armstrong Cork Company. Expansion splice. 3,640,557, Cl. 287-189.36

Nyland, Lloyd A.: *See*—
Harlan, Martin L.; Davis, Jerry L.; and Nyland, Lloyd A.,3,640,325.

Nystrand, Ernst Daniel; Spencer, Harvey J.; and Ziegelhoffer, Paul, to Paper Converting Machine Company, Inc. Bag boxing a machine. 3,640,050, Cl. 53-120.

Oakes, Malcolm M., to Hughes Aircraft Company. Welding supply circuit including capacitor bleed. 3,641,306, Cl. 219-113.

Oberst, Hermann; Leonhard, Hofheim; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Vibration damped sandwich systems having inter- layers of copolymers of ethylene and mixtures of isononane-, isodecane and isoundecane-carboxylic acid vinylesters. 3,640,835, Cl. 161-165.

Oberst, Hermann; Reihs, Leonhard Hofheim; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Vibration damped sandwich systems having interlayers of vinyl acetate-ethylene copolymers. 3,640,836, Cl. 161-165.

Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Vibration-damped sandwich systems having interlayers of vinyl acetate-ethylene-ethylacrylate copolymers. 3,640,830, Cl. 161-165.

Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Vibration damped sandwich systems having interlayers of vinyl acetate-ethylene-N-butylacrylate copolymers. 3,640,833, Cl. 161-165.

Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Vibration damped sandwich systems having interlayers of copolymers of vinyl acetate ethylene and mixtures of isononane-, isodecane- and isoundecane-carboxylic acid vinyl esters. 3,640,834, Cl. 161-165.

O'Brien, D. G., Inc.: *See*—
O'Brien, Donald G.; and Walker, Edward R., 3,641,479.

O'Brien, Donald G.; and Walker, Edward R.,to O'Brien, D. G., Inc. Underwater disconnectible connector. 3,641,479, Cl. 339-94.

Ochiai, Tuguo, to Tokyo Roki Kabushiki Kaisha. Filter paper for oil filters. 3,640,839, Cl. 162-129.

Odan, Kyoji: *See*—
Yamada, Keisho; Nagai, Shigeki; Odan, Kyoji; Arima, Yasutaka; and Hidaka, Mikio,3,641,101.

Yamada, Keisho; Nagai, Shigeki; Odan, Kyoji; Nakamura, Yasuo; and Hidaka, Mijio,3,641,100.
Odasso, Gianfranco: *See*—
Nathansohn, Giangiacomo; Odasso, Gianfranco; De Ruggieri; and Guzzi, Umberto,3,641,007.
Odawara, Daisaku. Rotary machine of the blade type. 3,640,648, Cl. 418-133.
O'Drobinak, John D.; and Kaufman, Martin H., to United States of America, Navy. Castable fluorocarbon binders for propellants. 3,640,785, Cl. 149-88.
O'Drobinak, John D.:*See*—
Kaufman, Martin H.; O'Drobinak, John D.; and Dake, James O., Jr.,3,640,070.
Oeckl, Otto. Tool changer for machine tools. 3,640,634, Cl. 408-35.
Oelmann, Peter; and Weisshuhn, Peter, to Johnson & Johnson. Sheet folding apparatus. 3,640,522, Cl. 270-72.
Oertel, Harald: *See*—
Thoma, Wilhelm; Oertel, Harald; Rinke, Heinrich; and Bahr, Ulrich,3,640,937.
Ogawa, Masao; Enjoji, Teruyuki; and Arai, Humio, to Showa Denko Kabushiki Kaisha. Flame-resistant foamed resin composition. 3,640,914, Cl. 260-2.5
Ogilvie Flour Mills Company, Limited: *See*—
Rolland, Jacques R.; and Holme, John, 3,640,730.
O'Hara, Mark J., to Universal Oil Products Company. Hydrocarbonaceous black oil conversion process. 3,640,817, Cl. 208-59.
Ohlhaber, Ronald L.: *See*—
Stockham, John D.; Townsend, Lawrence B.; Ohlhaber, Ronald L.; and Scopelite, Thomas M.,3,641,320.
Ohnsorge, Horst: *See*—
Herold, Wolf; and Ohnsorge, Horst,3,641,273.
Ohntrup, Frederick F.; Truemper, John P.; and Smith, Billy C., to Eaton Yale & Towne, Inc. Photoelectric motor control. 3,641,413, Cl. 318-480.
Ohorodnik, Alexander: *See*—
Sennewald, Kurt; Ohorodnik, Alexander; and Neumaier, Hubert,3,641,164.
Ohsaki, Kozo: *See*—
Konoki, Keizo; and Ohsaki, Kozo,3,640,052.
Ohshima, Haruhiko; Mizuno, Hiroshi; Konno, Akira; and Kosaka, Tomoaki, to Pioneer Electronic Corporation. Timer circuit of an automatic telephone answering apparatus. 3,641,270, Cl. 179-2.
Ohta, Noriyuki: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Matsui, Katsuaki; Kuramada, Tomoyuki; Watanabe, Ichiro; and Ohta, Noriyuki,3,640,928.
Ohta, Wasaburo: *See*—
Kasuya, Kazuhiko; Ohta, Wasaburo; and Okuno, Zenjiro,3,640,751.
Oikado, Taizo, to Nippon Electric Co., Ltd. Gas-filled discharge tube with gas refilling means. 3,641,385, Cl. 313-175.
Oishi, Yasushi: *See*—
Nagae, Tadashi; Oishi, Yasushi; and Hayashi, Jun,3,640,716.
Okada, Takaaki, to Kabushiki Kaisha Koparu. Device for indicating interrupted electric service. 3,641,545, Cl. 340-248.
Okado, Masaru: *See*—
Arimura, Tohru; Kamata, Masamoto; Okado, Masaru; and Ichimaru, Takarokuro,3,641,325.
Okamoto, Kenya; and Satoda, Hajime, to Matsushita Electric Industrial Co., Ltd. Liquid fuel burner. 3,640,673, Cl. 431-168.
O'Kane, Daniel F.:*See*—
Burns, Gerald; Giess, Edward A.; and O'Kane, Daniel F.,3,640,865.
Okano, Keigo: *See*—
Kinjo, Hisao; Iwabuchi, Yoshitaka; Takashima, Seiichi; Kato, Takotoshi; and Okano, Keigo,3,641,278.
Okita, Taisuke: *See*—
Usamoto, Teruyoshi; and Okita, Taisuke,3,641,215.
Okuma Machinery Works Ltd.: *See*—
Maeda, Yutaka; and Hirata, Kinya, 3,641,409.
Okuno, Zenjiro: *See*—
Kasuya, Kazuhiko; Ohta, Wasaburo; and Okuno, Zenjiro,3,640,751.
Okuno, Zenjiro; Mizuno, Akinori; and Kondoh, Ikuyo, to Kabushiki Kaisha Ricoh. Liquid electrostatic developer having pigment particles coated with a cyclized rubber. 3,640,863, Cl. 252-62.1
Olin Corporation: *See*—
Ence, Elmars, 3,640,779.
Raymond, Maurice A., 3,640,968.
Olin Mathieson Chemical Corporation: *See*—
Hadden, Edward H., 3,640,081.
Oliver, Joseph J.: *See*—
Bushnell, David; Fuller, Roger L.; and Oliver, Joseph J.,3,641,569.
Oliver, Rene A.: *See*—
Fauran, Claude P.; Raynaud, Guy M.; Oliver, Rene A.; and Douzon, Colette A.,3,641,036.
Olivetti, Ing., C., & C., S.p.A.: *See*—
Brescia, Riccardo; and Montanari, Lucio, 3,641,568.
Cortona, Alessandro; and Calano, Giuseppe, 3,641,269.
Cortona, Alessandro; Musso, Pietro; Saltini, Fabrizio; and Fiorenza, Giorgio, 3,641,317.
De Sandre, Giovanni; and Garziera, Gastone, 3,641,329.
Fantoni, Giuseppe, 3,640,147.
Ollearo, Giorgio, 3,640,397.
Piazza, Bruno, 3,640,216.
Saltini, Fabrizio, 3,641,508.
Ollearo, Giorgio, to Olivetti, Ing. C., & C., S.p.A. Tool holder for machine tools. 3,640,397, Cl. 211-1.5
Ollinger, James C.: *See*—
Nute, Ernest B., Jr.; and Ollinger, James C.,3,640,557.
Olorenshaw, John Kenneth. Resilient type leg exercising device. 3,640,526, Cl. 272-80.
Olsen, Roger F.: *See*—
Waner, Donald W.; Litzell, John E.; and Olsen, Roger F.,3,640,155.
Olson, John W.: *See*—
Artz, Walter M.; Cornelius, Kenneth R.; Olson, John W.; Signor, Gary R.; and Slojkowski, Francis E.,3,641,505.
Olsson, Per O. I., to Nitro Nobel AB. Electric blasting cap having increased safety against unintentional initiation. 3,640,223, Cl. 102-28.
Olund, Sven A., to Chevron Research Company. Plybutene containing soluble oils. 3,640,856, Cl. 252-33.2
Omark Industries, Inc.: *See*—
Ritter, Ralph Kenneth; Pease, Charles C.; and Fay, Elliott J., 3,641,305.
Omron Tateisi Electronics Co.: *See*—
Hatano, Isao; Kitajima, Kenichi; and Iwatani, Katsumi, 3,641,330.
Nagata, Masanori; and Mori, Masato, 3,641,315.
Ondrey, John A.; and Swift, Harold E., to Gulf Research & Development Company. Method for producing unsaturated aldehydes and acids. 3,641,138, Cl. 260-530.
O'Neal, John E.,60% to Cotton, John J. Mortise groove knife. 3,639,982, Cl. 30-279.
Onopchenko, Anatoli; Schulz, Johann G. D.; and Seekircher, Richard, to Gulf Research & Development Company. Process for oxidizing a 1,1-bis(alkylphenyl) alkane. 3,641,135, Cl. 260-524.
Onopchenko, Anatoli; Schulz, Johann G. D.; and Seekircher, Richard, to Gulf Research & Development Company. Process for oxidizing a 1,1-bis(alkylphenyl) alkane. 3,641,136, Cl. 260-524.
Oppenheimer, Seymour; and Turbak, Albin F., to Tee-Pak, Inc. Preparation of fibrous reinforced casing form alkali soluble polyvinyl alcohol copolymers. 3,640,734, Cl. 79-176.
Oppenheimer, Seymour; and Turbak, Albin F., to Tee-Pak, Inc. Fibrous reinforced polyvinyl alcohol casings. 3,640,735, Cl. 99-176.
Optipatent AG: *See*—
Hampel, Gerald; and Gruss, Hansgeorg, 3,640,663.
Orfeo, Sabatino R.; and Murphy, Kevin P., to Allied Chemical Corporation. Fluorocarbon compositions. 3,640,869, Cl. 252-67.
Organon Inc.: *See*—
Panneman, Harm Jean, 3,641,026.
Orpha Brandon: *See*—
Brandon, Clarence W., 3,640,344.
Osborne, Thomas E., to Hewlett-Packard Company. Keyboard entry means and power control means for calculator. 3,641,328, Cl. 235-156.
Ose, Earl E.: *See*—
Davis, William W.; and Ose, Earl E.,3,641,241.
Ost, Walter; Thomas, Klaus; Jerchel, Dietrich; and Linden, Gerbert, to Boehringer, C. H. Sohn. Carbonate esters of 3,5-dihalo-4-hydroxybenzonitriles. 3,641,062, Cl. 260-347.4
Osterreichische Stickstoffwerke Aktiengesellschaft: *See*—
Goller, Heinz, 3,640,685.
Ostrom, Martin E., to Keystone Consolidated Industries, Inc. Caster bracket assembly. 3,639,942, Cl. 16-29.
Osugi, Kinichiro; Suzuki, Yoshiaki; Mori, Tokio; and Inamoto, Toshiharu, to Matsushita Electric Industrial Co., Ltd. Display system for use in desk-top computers. 3,641,561, Cl. 340-324.
O'Sullivan, Denis Joseph:*See*—
Bolger, Bernard Joseph; and O'Sullivan, Denis Joseph,3,640,972.
Ott, Hans: *See*—
Galantay, Eugene E.; and Ott, Hans,3,641,133.
Ott, Karl-Heinz; Schuster, Herbert; Meckel, Walter; Dinges, Karl; and Muller, Erwin, to Farbenfabriken Bayer Aktiengesellschaft. Emulsion polymerization employing azoacyl catalysts. 3,641,209, Cl. 260-880.
Ottow, Melvin A.: *See*—
Lutz, Leland H.; Heileman, Richard C.; Upstone, Harlan R.; Leonard, John M.; and Ottow, Melvin A.,3,639,950.
Ouchi, Hiromu: *See*—
Nishida, Masamitsu; and Ouchi, Hiromu,3,640,866.
Over, William Roderick, to AMP Incorporated. Method of connecting pairs of wires. 3,639,977, Cl. 29-628.
Overhead Door Corporation: *See*—
Luby, John J.; and Pemberton, Paul E., 3,640,332.
Overmars, Henricus Gerardus Josef; Van Elven, Aris; and Noltes, Jan Gerrit, to International Lead Zinc Research Organization, Inc. Process for alkylating aromatic compounds. 3,641,178, Cl. 260-671.
Owens, Raymond Clyde, to RCA Corporation. Semiconductor mounting structure. 3,641,474, Cl. 339-17.
Owens-Corning Fiberglas Corporation: *See*—
Rees, Vernon C., 3,641,514.
Scott, James W., 3,640,793.
Owens-Illinois, Inc.: *See*—
Lee, Haynes A., Jr.; and Rapp, Charles F., 3,640,890.
Lee, Haynes A., Jr.; and Rapp, Charles F., 3,640,891.
Levene, Leon; and Thomas, Ian M., 3,640,093.
Wojcik, Gerald E., 3,640,906.

Oxford Laboratories: *See*—
Smernoff, Ronald B., 3,640,687.
Ozawa, Shuji; and Fujie, Hiroshi, to Teijin Limited. Process for preparation of polyamides. 3,640,970, Cl. 260-78.
Pacault, Pierre H.; and Dostantni, Albert, to Babcock & Wilcox, Limited. Heat exchanger arrangement. 3,640,339, Cl. 165-76.
Packaging Industries, Inc.: *See*—
Brown, Fred P., Jr.; and Rohdin, Howard A., 3,640,668.
Page, Howard M., to Leath, McCarthy & Maynard, Inc. Panty hose measuring apparatus and method. 3,639,987, Cl. 33-2.
Page, John D.: *See*—
Anderson, Gordon C.; and Page, John D.,3,640,062.
Painkin, Harold: *See*—
Irish, Carleton D.; and Painkin, Harold,3,641,475.
Palauro, Dieter K.: *See*—
Coyne, Merton W.; and Palauro, Dieter K.,3,640,351.
Palfreyman, Jack; and Middleton, Henry Edward, to Rolls-Royce Limited. Fluid flow machine. 3,640,640, Cl. 416-2.
Paliyenko, Paul; and Beier, Werner E., to Fiber Industries, Inc. Spinnerette for extruding T-shaped filaments. 3,640,670, Cl. 18-8.
Pallat, Ludwig R.: *See*—
Brockett, Peter C.; and Pallat, Ludwig R.,3,641,486.
Palm, Clifford W.; and Gibson, William R., to Celanese Corporation. Novelty yarn. 3,640,064, Cl. 57-144.
Palmenberg, Edward C., to Chromalloy American Corporation. Means for measuring bow in a turbine blade. 3,639,994, Cl. 33-174.
Panaura Limited: *See*—
Burgess, Robert Stuart, 3,640,795.
Panfili, Jack. Clip for closing fragile stuffed casings. 3,640,317, Cl. 140-82.
Panneman, Harm Jean, to Organon Inc. Phthalazine derivatives. 3,641,026, Cl. 260-250.
Paoli, Thomas L.; and Ripper, Jose' E., to Bell Telephone Laboratories, Incorporated. Apparatus and method for narrowing the pulse width and stabilizing the repetition rate in semiconductor lasers exhibiting self-induced pulsing. 3,641,459, Cl. 331-94.5
Papa, Anthony Joseph; and Proops, William Robert, to Union Carbide Corporation. Phenolic foam process. 3,640,911, Cl. 260-2.5
Paper Converting Machine Company, Inc.: *See*—
Nystrand, Ernst Daniel; Spencer, Harvey J.; and Ziegelhoffer, Paul, 3,640,050.
Paragon Wire & Cable Corporation: *See*—
Gaul, Robert G., 3,640,176.
Parke, Davis & Company: *See*—
Schweiss, Dieter; and Long, Loren M., 3,641,010.
Parker Industries, Inc.: *See*—
Parker, Shirley L.; and Rohrer, John D., 3,640,423.
Parker, Shirley L.; and Rohrer, John D., to Parker Industries, Inc. Tool box for pick-up truck. 3,640,423, Cl. 220-31.
Parker-Hannifin Corporation: *See*—
Siwik, Anthony F., 3,640,554.
Parker-Knoll Limited: *See*—
Howland, Robin, 3,640,567.
Parry, James R.: *See*—
Fox, Marvin L.; and Parry, James R.,3,640,304.
Parry, Philip James: *See*—
Taylor, Brian; and Parry, Philip James,3,640,777.
Parshin, Alexei Nikolaevich: *See*—
Makachev, Nilolai Ivanovich; Parshin, Alexei Nikolaevich; Smurov, Georgy Sergeevich; and Stepanets, Alexei Trofimovich,3,640,316.
Partridge, Jerry A.; and Jensen, Reilly C., to United States of America, Atomic Energy Commission. Method for purification of di-(2-ethylhexyl) phosphoric acid. 3,641,226, Cl. 260-990.
Pasko, Victor. Dental instrument. 3,639,985, Cl. 32-11.
Patel, Jayantilal M.: *See*—
Bolt, Gregory L.; Brandt, Charles H.; McLain, Aubrey R.; and Patel, Jayantilal M.,3,640,726.
Path Computer Equipment Inc.: *See*—
Klockenbrink, Joseph M., 3,641,560.
Pause, Helmut: *See*—
Vogt, Herbert; and Pause, Helmut,3,640,123.
Pavelle Corporation, The: *See*—
Aston, Keith, 3,640,618.
Pawson, Beverly Ann; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Juvabione and derivatives thereof. 3,641,156, Cl. 260-586.
Pearson, Herbert Irvin. Hide-away trailer hitch. 3,640,550, Cl. 280-491.
Pease, Charles C.: *See*—
Ritter, Ralph Kenneth; Pease, Charles C.; and Fay, Elliott J.,3,641,305.
Peccerill, Donald: *See*—
Rowe, Robert L.; and Peccerill, Donald,3,640,657.
Peck, David W.; and Gentry, Robert R., to Union Carbide Corporation. Method for producing esters of polycyclic compounds. 3,641,115, Cl. 260-475.
Pederson, Donald J.: *See*—
Hamilton, John F.; and Pederson, Donald J.,3,640,585.
Peek, Henry L.: *See*—
Armitage, Charles H.; Peek, Henry L.; and Pflanz, Herbert M.,3,641,293.
Armitage, Charles H.; Peek, Henry L.; and Pflanz, Herbert M.,3,641,294.
Peel, Richard V.; and Phillips, Billie W., to Marquardt Industrial Products Co. Train length measurement system. 3,641,338, Cl. 246-1.
Pemberton, Paul E.: *See*—
Luby, John J.; and Pemberton, Paul E.,3,640,332.
Penders, Edward F. Word forming game device. 3,640,531, Cl. 273-1.
Pendulous range finding device: *See*—
Koeber, Henry J.; and Pendulous range finding device,3,639,997.
Peon, Gilbert A.: *See*—
Staehlin, John H.; and Peon, Gilbert A.,3,640,168.
Peratis, Michael P., to Ampex Corporation. Magnetic core inspection device. 3,640,374, Cl. 198-30.
Perkin-Elmer Corporation, The: *See*—
Lee, Paul H., 3,641,456.
Markle, David A., 3,641,344.
Perkins-Elmer Corporation, The: *See*—
Preston, Kendall, Jr., 3,641,355.
Perks, Arthur Francis, to Bell Telephone Laboratories, Incorporated. Linearity compensation for a voltage-controlled oscillator. 3,641,463, Cl. 332-16.
Perna, Aldo; and de Varda, Giorgio, to Societa Italiana Telecomunicazioni Siemens S.p.A. Automatic circuit-testing means for time-sharing telecommunication system. 3,641,275, Cl. 179-15.
Pernoud, Claude: *See*—
Colinet, Andre; Mercier, Jacques; and Pernoud, Claude,3,640,457.
Perrault, Jean; and Salle, Adelin E. G., to International Standard Electric Corporation. Data transmission system bidirectional data transmission system with error correction. 3,641,494, Cl. 340-146.1
Perrinet, Paul Marie, to SEMIA S.A. Hot air generator with variable length conduit. 3,640,458, Cl. 237-50.
Persson, Jan Edvard. Screw rotors. 3,640,649, Cl. 418-191.
Peterson, Eugene W.: *See*—
Buller, Joseph S.; Nagy, Michael J.; and Peterson, Eugene W.,3,640,091.
Peterson, Joseph R.: *See*—
Baybarz, Russell D.; and Peterson, Joseph R.,3,640,888.
Peterson, Wendell C. Ultrasonic cleaner and surgical instrument case. 3,640,295, Cl. 134-159.
Petocz, Lujza: *See*—
Rakoczi, Jozsef; Mikite, Gyula; Petocz, Lujza; Fischer, Janos; Grasser, Katalin; and Kosoczky, Ibolya,3,641,039.
Petree, Harris E., to Ciba-Geigy Corporation. Stoichiometric regulation in chemical reactions involving a highly reactive acid chloride, anhydride or a derivative thereof. 3,641,025, Cl. 260-249.5
Petri, Rolf: *See*—
Reinhard, Hans; Petri, Rolf; and Beckerle, Wilhelm-Friedrich,3,640,912.
Petrick, John T.; and Gray, Reginald I., to United States of America, Navy. R.F. immune firing circuit employing high impedance leads. 3,640,224, Cl. 102-28.
Petropoulas, Spyros K.; Jehle, Robert E.; and Halberstam, Mendel M., to United States of America, Navy. Infrared analyzer for indicating the scintillation spectrum shimmer and modulation transfer function of the radiation path. 3,641,350, Cl. 250-83.3
Petroskey, Paul P. Float apparatus for bicycle. 3,640,239, Cl. 115-27.
Petrow, Henry G.: *See*—
Juda, Walter; Allen, Robert J.; and Petrow, Henry G.,3,640,774.
Petrow, Valdimir: *See*—
Ellis, Bernard; Petrow, Valdimir; and Stanway, David Neil,3,641,008.
Peuker, Kurt; and Sommer, Heinrich, to Pohlig-Heckel-Bleichert, Vereinigte Maschinenfabriken A.G. Unloader for bulk material in which a chain bucket elevator constitutes the receiving and elevating apparatus. 3,640,376, Cl. 198-91.
Pews, R Garth; and Corson, Fred P., to Dow Chemical Company, The. Alkyl esters of 6-(benzenesulfonyl)-trihalo-2- picolinic acid. 3,641,004, Cl. 260-239.8
Pews, Richard Garth; Hand, Clare R.; and Roberts, Carleton W., to Dow Chemical Company, The. Adducts of tetrabromodialkoxy cyclopentadienes and allyl alcohol. 3,641,160, Cl. 260-611.
Peyrot, Jean: *See*—
Gluntz, Claude; Meyer, Pierre; and Peyrot, Jean,3,640,982.
Pfister, Alain: *See*—
Reulet, Philippe; Pfister, Alain; Tellier, Jacques; Blanc, Jean-Henry; Jorgensen, Kirsten Borre; and Bohlbro, Hans,3,641,102.
Pfizer Inc.: *See*—
DeCaspern, Anthony J., 3,640,896.
Liu, Wen Chih, 3,641,243.
Pflanz, Herbert M.: *See*—
Armitage, Charles H.; Peek, Henry L.; and Pflanz, Herbert M.,3,641,293.
Armitage, Charles H.; Peek, Henry L.; and Pflanz, Herbert M.,3,641,294.
Phelps, Rex V., to Warren Petroleum Corporation. Multicylinder vessel for transportation of fluids. 3,640,237, Cl. 114-16.
Phillips, Alan R.: *See*—
Jope, Bruce T.; and Phillips, Alan R.,3,640,666.
Phillips, Arthur P.; and Burrows, Robert B., to Burroughs Wellcome & Co. (U.S.A.), Inc. Styryl thiazolium salts. 3,641,012, Cl. 260-240.9
Phillips, Billie W.: *See*—
Peel, Richard V.; and Phillips, Billie W.,3,641,338.
Phillips, Lawrence, Jr., to Unicorn Industries, Inc. Exterior power supply connection for recreation vehicles. 3,641,472, Cl. 339-10.

Phillips Petroleum Company: *See*—
Box, E O., Jr.; and Uhrick, David A., 3,641,182.
Burleigh, John E.; and Uraneck, Carl A., 3,640,986.
Cobb, Raymond L., 3,641,075.
Fritz, Richard C.; and Galvanoni, Aldo B., 3,640,049.
Geraldo, Antonio A., 3,640,939.
Kuper, Donald G., 3,641,130.
Larkin, Mark E., 3,639,970.
Naylor, Floyd E., 3,640,899.
Naylor, Floyd E., 3,640,990.
Seefluth, Charles L., 3,640,665.
Smith, Clifford E.; and White, Bobby J., 3,641,184.
Trepka, William J.; and Sonnenfeld, Richard J., 3,640,988.
Walker, Darrell W., 3,640,901.
Warner, Paul F.; and Huxley, Edward E., 3,640,736.
Williams, Ralph P., 3,641,099.
Phinizy, R. B.: *See*—
Hedin, Robert A., 3,641,498.
Phonplex Corporation: *See*—
Slavin, Martin J., 3,641,496.
Phung, Nhu Hung; and Le Febvre, Gilles, to Institut Francais du Petrole des Carburants et Lubrifiants. Process for manufacturing titanium trichloride, the catalysts obtained therefrom and their uses in the polymerization of polymerizable monomers. 3,640,987, Cl. 260-93.7
Piana, Francesco; and Brega, Angelo. Mecmor S.p.A. Device for cutting and gripping threads in circular knitting machines and the like. 3,640,094, Cl. 66-19.
Piasecki Aircraft Corporation: *See*—
Korsak, Kazimierz, 3,640,185.
Piazza, Bruno, to Olivetti, Ing. C., & C., S.p.A. Parallel printing apparatus for recorded data. 3,640,216, Cl. 101-93.
Piccolo, Jerry, to Advance Metal Products, Inc. Electric sonic device for cleaning small articles. 3,640,294, Cl. 134-217.
Pickering, Timothy Lee: *See*—
Brode, George Lewis; and Pickering, Timothy Lee,3,640,965.
Pickert, Paul Eugene, to Union Carbide Corporation. Process for preparing supersiliceous zeolites. 3,640,681, Cl. 23-111.
Picquendar, Jean Edgar; and Torguet, Roger, to Thomson-CSF. Readout system for memories comprising matrices of photosensitive elements. 3,641,513, Cl. 340-173.
Picut, Frederick R.,: *See*—
Reick, Franklin G.; and Wilder, Joseph R., 3,641,332.
Pidgeon, Eric: *See*—
Love, Dennis Anthony; Neal, David Patrick John; and Pidgeon, Eric,3,641,001.
Pigage, Robert F.; Ryan, Arthur B.; and Smith, Robert E., to Gleason Works, The. Method for inspecting and adjusting cutter blades. 3,641,431, Cl. 324-61.
Pilkington Brothers Limited: *See*—
Giddings, David George; and Twist, Douglas, 3,640,694.
Pinet, Andre E.; and Gouttebel, Raymond P. Time division automatic telephone switching equipment. 3,641,272, Cl. 179-15.
Pingon, Pierre Joseph. Transportable tower crane for rapid erection. 3,640,401, Cl. 212-49.
Pinkham, Jesse R., to Reynolds, R. J., Tobacco Company. Filter construction and method of forming same. 3,640,287, Cl. 131-261.
Pintschovius, Ulrich: *See*—
Frischkorn, Hans; Pintschovius, Ulrich; Schinzel, Erich; and Smerz, Otto,3,641,051.
Pioch, Robert J., to Kysor Industrial Corporation. Waste materials handling system. 3,640,410, Cl. 214-38.
Pioneer Electronic Corporation: *See*—
Ohshima, Haruhiko; Mizuno, Hiroshi; Konno, Akira; and Kosaka, Tomoaki, 3,641,270.
Pirnik, Michael P.: *See*—
Napier, Roger P.; and Pirnik, Michael P.,3,641,061.
Pitney-Bowes, Inc.: *See*—
Beck, Christian A., 3,640,523.
Pittman, Ed P.; and Stanford, Roy A., to United States of America, Navy. Electric field sensor. 3,641,427, Cl. 324-9.
Plana, Roberto, to AMP Incorporated, mesne. Housing for an electrical terminal. 3,641,477, Cl. 339-59.
Plasynski, Joseph E.; and Jerabek, Robert D., to PPG Industries, Inc. Steam rinsing of electrocoated articles. 3,640,810, Cl. 204-181.
Platz, Rolf, and Merger, Franz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of 2,2-dimethyl-1,3-propanediol-mono(hydroxypivalate). 3,641,117, Cl. 260-484.
Platz, Rolf, and Merger, Franz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Purification of 2,2-dimethyl-1,3-propanediol mono(hydroxypivalate). 3,641,118, Cl. 260-484.
Plette, David L., to General Electric Company. Frequency conversion system. 3,641,418, Cl. 321-7.
Plumadore, Harold M.: *See*—
Boudouris, Angelo; Kulish, Stanley J., Jr.; and Plumadore, Harold M.,3,640,611.
Plumer, Lawrence H., to Rutland Fire Clay Company. Shut-off nozzle for caulking cartridge. 3,640,431, Cl. 222-48.
Poff, Thomas J.: *See*—
Rocks, Eugene S.; and Poff, Thomas J.,3,641,400.
Pohlig-Heckel-Bleichert, Vereinigte Maschinenfabriken A.G.: *See*—
Peuker, Kurt; and Sommer, Heinrich, 3,640,376.
Polaroid Corporation: *See*—
Buckler, Sheldon A.; and Lambert, Ronald F., 3,640,713.
Douglas, Lawrence M.; and Erlichman, Irving, 3,640,200.
Erlichman, Irving, 3,640,724.
Johnson, Bruce K.; and Hendry, Donald H., 3,640,194.
Simon, Myron S., 3,641,034.
Polgar, Michael S.: *See*—
Spanos, William M.; and Polgar, Michael S.,3,641,578.
Pollart, Dale Flavian: *See*—
Lundberg, Robert Dean; Koleske, Joseph Victor; Pollart, Dale Flavian; and Smarook, Walter Henry,3,641,204.
Polly, George W.: *See*—
McAndrew, France B.; Polly, George W.; and Heinz, Walter E.,3,641,192.
Polotovskaya, Lidia Grigorievna: *See*—
Skripko, Leonid Alexandrovich; Rozantsev, Eduard Grigorievich; and Polotovskaya, Lidia Grigorievna,3,641,091.
Polson, Alfred; and Katz, Woolf, to South African Inventions Development Corporation. Chemically hardened gelatin separating medium for chromatography and ion exchange and method of making the same. 3,640,809, Cl. 204-180.
Poly-Optics, Inc.: *See*—
Wall, Lamar J., 3,641,335.
Polymer Corporation Limited: *See*—
La Flair, Ronald Turner; and Henderson, John Frederick, 3,641,205.
Polymer Corporation, The: *See*—
Richart, Douglas Steven, 3,640,747.
Pomagalski, Jean, S. A.: *See*—
Durand, Marce, 3,640,506.
Pomagalski, Jean, S.A.: *See*—
Durand, Marcel, 3,640,505.
Pomaret, Carlos: *See*—
Pourrias, Bernard; Huet, Yves; and Pomaret, Carlos,3,641,124.
Poole, Sidney W.: *See*—
Ries, Gerald D.; and Poole, Sidney W.,3,640,690.
Porret, Daniel; Habermeier, Juergen; and Batzer, Hans, to Ciba Limited. Advanced addition products containing terminal epoxide groups. 3,640,910, Cl. 260-2.
Porter, Harry B.; and Weinhardt, Robert A., to United States of America, Navy. Release mechanism. 3,640,484, Cl. 244-3.21
Porter, Laurence W., to Vaughan & Bushnell Mfg. Co. Hammerhead having an anti-slip and wear- resistant striking face surface. 3,640,324, Cl. 145-29.
Portwood, Owen, Jr.; Starks, Charles M.; and Washecheck, Paul H., to Continental Oil Company. Process for preparing dimethylacetal. 3,641,163, Cl. 260-615.
Potin, Marcel, to Societe Financiere Francaise de Licences et Brevets. Method and device for making and finishing zip fasteners. 3,639,969, Cl. 29-408.
Potter Instrument Company, Inc.: *See*—
Fieldgate, Ivan O., 3,641,567.
Pourrias, Bernard; Huet, Yves; and Pomaret, Carlos, to Delalande S.A. Heptaminol trans-cinnamate. 3,641,124, Cl. 260-501.17
Powers, Earl N.: *See*—
Di Vita, Philip S.; Powers, Earl N.; and Werneth, Charles J.,3,641,509.
PPG Industries, Inc.: *See*—
Darr, Donald E.; Edwards, G Byron; Loehr, Clifford E.; and Young, Elgin E.,3,640,745.
Dietz, Albert; Goodspeed, Neil C.; and May, Russell R., Jr., 3,640,744.
Plasynski, Joseph E.; and Jerabek, Robert D., 3,640,810.
Stevens, Henry C., 3,640,985.
Pramaggiore, Luigi. Electric Fuse. 3,641,469, Cl. 337-404.
Prasad, Brijeshwari,: *See*—
Cushman, Glenn F.; Prasad, Brijeshwari,; and Wisleder, Robert W.,3,641,563.
Prasil, Vladimir: *See*—
Lutovsky, Josef; and Prasil, Vladimir,3,640,059.
Pre-Load Company Inc., The: *See*—
Heron, James, 3,640,038.
Precisa A.G. Rechenmaschinenfabrik: *See*—
Scheinhutte, Hans-Jurgen, 3,640,214.
Preh Elektrofeinmechanische Werke: *See*—
Labude, Wolfgang; and Kohler, Josef, 3,641,471.
Preisler, Samuel L. Skid-proof traction mat for automotive vehicles. 3,640,459, Cl. 238-14.
Prentice, James B., to Procter and Gamble Company, The. Process for preparation of ethane-1-hydroxy-1,1,2- triphosphonates from ethanecarbonyl-1,2-diphosphonates. 3,641,126, Cl. 260-502.4
Preston, George A.: *See*—
Giardini, Dante S.; Preston, George A.; and Roney, Richard N.,3,640,163.
Preston, Kendall, Jr., to Perkins-Elmer Corporation, The. Optical correlator. 3,641,355, Cl. 250-229.
Preusch, William J.: *See*—
Reiner, Joel Russell; Preusch, William J.; and Davenport, William G.,3,640,233.
Price, Alson K.: *See*—
Anello, Louis G.; Boghosian, Edward Michael; Jones, Edward S.; Minhas, Pritam S.; Price, Alson K.; and Sweeney, Richard F.,3,641,083.
Price, James H. Job site apparatus for horizontally pouring and vertical stocking of thin slabs. 3,640,658, Cl. 25-1.
Price, John A.: *See*—
Stewart, Mary J.; and Price, John A.,3,640,964.

Price, Raymond E.; and Tirrell, Clifford F., to Grace, W. R., & Co. Closure arresting device. 3,639,968, Cl. 29-211.
Price, Vernon G.; and Grow, Richard W., to United States of America, Atomic Energy Commission. Compact high-power broadband radio-frequency load termination. 3,641,465, Cl. 333-22.
Pricer, Wilbur David: *See*—
Castrucci, Paul P.; Gates, Harlan R.; Henle, Robert A.; Pricer, Wilbur David; Morton, Robert M.; Mason, John W.; and North, William D.,3,641,516.
Pridgen, Herman S.: *See*—
Weaver, Max A.; Pridgen, Herman S.; and Coates, Clarence A., Jr.,3,640,995.
Primus, Norman S.; and Hunhoff, Raymond, to National Water Main Cleaning Co. Method for lining pipes with calcite. 3,640,759, Cl. 117-97.
Procter & Gamble Company, The: *See*—
Bolt, Gregory L.; Brandt, Charles H.; McLain, Aubrey R.; and Patel, Jayantilal M., 3,640,726.
Francis, Marion D., 3,641,246.
Heusinkveld, Merlyn R., 3,640,727.
Procter and Gamble Company, The: *See*—
Prentice, James B., 3,641,126.
Proctor, Richard I. Frictional resistant type exercise machine with waist level mounted oscillatable handgrips. 3,640,525, Cl. 272-79.
Proctor, Richard I. Weight resistant chest exercising device. 3,640,527, Cl. 272-81.
Proctor, Richard. Pull type variable weight exercising device. 3,640,528, Cl. 272-81.
Projektovy ustav dopravnich a inzenyrskych staveb: *See*—
Holecek, Milan, 3,641,581.
Proops, William Robert: *See*—
Papa, Anthony Joseph; and Proops, William Robert,3,640,911.
Prosprich, Frank B., to Veeder Industries Inc. Gasoline pump multiplexer system for remote indicators for self-service gasoline pumps. 3,641,536, Cl. 340-203.
Protective Pads, Inc.: *See*—
Gardner, Lawrence J.; and Cochren, Donald R., 3,640,831.
Prototech Co.: *See*—
Juda, Walter; Allen, Robert J.; and Petrow, Henry G., 3,640,774.
Prototech Company: *See*—
Allen, Robert J.; and Novack, Robert Lee, 3,640,773.
Provenzino, Andrew V.: *See*—
McKee, Clyde M.; Provenzino, Andrew V.; and Scott, Ward,3,640,608.
McKee, Clyde M.; Provenzino, Andrew V.; and Scott, Ward,3,640,609.
Pryor, Clyde Robert: *See*—
Hollingsead, Robert A.; Kuchler, Abraham; and Pryor, Clyde Robert,3,640,141.
Pugh, John G. Multiple belt punch. 3,640,481, Cl. 242-56.8
Pungs, Wolfgang: *See*—
Buning, Robert; Raalf, Hans; and Pungs, Wolfgang,3,640,930.
Purcell, Antoninette M., to National Cash Register Company, The. Encapsulation process and its product. 3,640,892, Cl. 252-316.
Purdue Frederick Company, The: *See*—
Altman, Murray; Craig, Mordecai R.; and Block, Irwin H., 3,640,010.
Purdue Research Foundation: *See*—
Bachman, Gustave B.; and Tullman, Gerald M., 3,641,122.
Puritan-Bennett Corporation: *See*—
Schwarz, Karl H., 3,641,296.
Quaedvlieg, Mathieu: *See*—
Walz, Klaus; Hees, Walter; and Quaedvlieg, Mathieu,3,640,677.
Querfeld, Hermann; Mattes, Heinz Otto; and Flesch, Friedrich, to Langensiepen, Max, Kom. Ges. Emmendingen. Wall facing. 3,640,043, Cl. 52-508.
Raab, Lester R.; and Toby, Dennis E., to Addressograph-Multigraph Corporation. Liquid developing apparatus. 3,640,203, Cl. 95-89.
Raalf, Hans: *See*—
Buning, Robert; Raalf, Hans; and Pungs, Wolfgang,3,640,930.
Rabinowitz, Paul J.: *See*—
La Tourrette, James T.; Newstein, Maurice C.; and Rabinowitz, Paul J.,3,641,458.
Radin, Bernard G., to Ford Motor Company. Low liquid level indicator. 3,641,544, Cl. 340-244.
Radscheit, Kurt; Stache, Ulrich; Haede, Werner; Fritsch, Werner; and Lindner, Ernst, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Cardio-active oxido-bufadienolides. 3,641,009, Cl. 260-239.57
Radtke, Schrade F., to International Lead Zinc Research Organization, Inc. Process for preparing dialkylzinc compounds from alkylbromide and alkyliodide. 3,641,080, Cl. 260-429.9
Radtke, Schrade F., to International Lead Zinc Research Organization, Inc. Process for preparing dialkylzinc compounds from alkylbromide. 3,641,081, Cl. 260-429.9
Rain Jet Corporation: *See*—
Hruby, John O., Jr., 3,640,472.
Raines, Kenneth: *See*—
Burke, George K.; and Raines, Kenneth,3,640,275.
Rainey, James L.: *See*—
Mansfield, Richard C.; and Rainey, James L.,3,640,998.
Raion Yushi Kabushiki Kaisha: *See*—
Susuki, Rinnosuke; Hoshi, Hiroshi; and Araki, Shinichi, 3,640,470.
Rakoczi, Jozsef; Mikite, Gyula; Petocz, Lujza; Fischer, Janos; Grasser, Katalin; and Kosoczky, Ibolya, to Egyesult Gyogyszer es Tapszergyar. Cyclic ketal derivatives of certain tropinones and nortropinones. 3,641,039, Cl. 260-292.
Rakow, Marvin S.; and Konig, Robert J., to Cities Service Oil Company. Stabilized distillate hydrocarbon fuel oil compositions and additives therefor. 3,640,692, Cl. 44-63.
Ram Domestic Products Company: *See*—
Romanelli, Pat, 3,640,455.
Randall, David I.: *See*—
Field, Nathan D.; Randall, David I.; and Fitzpatrick, Jimmie D.,3,640,934.
Randolph, August: *See*—
Huckstadt, Harald; Saleck, Wilhelm; Randolph, August; Moll, Franz; and Ranz, Erwin,3,640,715.
Ranz, Erwin: *See*—
Huckstadt, Harald; Saleck, Wilhelm; Randolph, August; Moll, Franz; and Ranz, Erwin,3,640,715.
Rapp, Charles F.: *See*—
Lee, Haynes A., Jr.; and Rapp, Charles F.,3,640,890.
Lee, Haynes A., Jr.; and Rapp, Charles F.,3,640,891.
Rapulber, William E.; and Koenig, Richard G., to McDonnell Douglas Corporation. Coordinate conversion calculator. 3,639,989, Cl. 33-1.
Raschke, Herbert A., to Bullard, E. D., Company. Connector for hand tool suspension system. 3,640,555, Cl. 287-103.
Rassieur, Charles L., to Central Mine Equipment Company. Hollowstem auger head with seal. 3,640,354, Cl. 175-243.
Rassmann, Christoph; and Heyer, Willy, to Gewerkschaft Eisenhutte Westfalia. Arrangements for controlling the guidance of a mineral mining plough. 3,640,581, Cl. 299-32.
Rast, Gustav E.; and Steiner, Russell I., to Allied Chemical Corporation. Edible substrates colored with monozo dyestuffs. 3,640,733, Cl. 99-148.
Rattenbury, Kenneth H.: *See*—
Friedman, Lester; Rattenbury, Kenneth H.; and Guttag, Alvin,3,641,218.
Rauner, Frederick J.: *See*—
Arcesi, Joseph A.; and Rauner, Frederick J.,3,640,722.
Ravenel, Pierre: *See*—
Frerson, Raymond; Gravier, Claude; Ravenel, Pierre; and Soupene, Pierre,3,640,621.
Rawlings, Herbert L., to Baychem Corporation, mesne. Stabilized polycarbonates. 3,640,951, Cl. 260-45.8
Ray, Tommy D.Strap assembly for securing a patient's arm to an arm board. 3,640,273, Cl. 128-87.
Raychem Corporation: *See*—
Althouse, Victor E., 3,639,917.
Raymond, Maurice A., to Olin Corporation. Curable divinyl acetal copolymers. 3,640,968, Cl. 260-77.5
Raynaud, Guy M.: *See*—
Fauran, Claude P.; Raynaud, Guy M.; Oliver, Rene A.; and Douzon, Colette A.,3,641,036.
Raytheon Company: *See*—
Bushnell, David; Fuller, Roger L.; and Oliver, Joseph J., 3,641,569.
Engelhardt, Bjorn H., 3,641,449.
Monser, George J., 3,641,580.
RCA Corporation: *See*—
Bond, Donald S., 3,641,432.
Di Stefano, Ralph David; and James, Edward Anthony, 3,640,765.
Fitzgerald, William Vincent, Jr., 3,641,398.
Fulton, Thomas Philip; and Di Luca, Henry, 3,640,767.
Gamble, Edward Bernard, 3,641,362.
Gamble, Edward Bernard; and Aires, Ramon Hess, 3,641,368.
Limberg, Allen Leroy; and Steckler, Steven Alan, 3,641,361.
Macovski, Albert, 3,641,255.
Mrozek, Pawel K., 3,641,461.
Owens, Raymond Clyde, 3,641,474.
Ryan, Robert J., 3,640,853.
Steckler, Steven Alan, 3,641,258.
Steckler, Steven Alan, 3,641,448.
Vossen, John Louis, Jr.; and Banfield, Joseph Henry, 3,640,812.
Read, George D.: *See*—
Gewertz, Harry R.; and Read, George D.,3,640,558.
Reading, James E.: *See*—
Goy, Thomas J.; Knieriemen, Richard P.; and Reading, James E.,3,640,390.
Recherche et Industrie Therapeutiques R.I.T.: *See*—
Eyssen, Henrik, 3,640,848.
reditelstvi: *See*—
Lutovsky, Josef; and Prasil, Vladimir, 3,640,059.
Reed, William A.; and Cole, Frank J., to Republic Steel Corporation. Method for vaporizing molten metal. 3,640,762, Cl. 117-107.1
Rees, Donald Frank; Garnett, John Baron; and Richardson, Michael Alexander, to Rees, William F., Limited. Tunnels or tunnelling. 3,640,076, Cl. 61-42.
Rees, Vernon C., to Owens-Corning Fiberglas Corporation. Memory system. 3,641,514, Cl. 340-173.
Rees, William F., Limited: *See*—
Rees, Donald Frank; Garnett, John Baron; and Richardson, Michael Alexander, 3,640,076.
Regel, Erik K.: *See*—
Botts, Marion F.; and Regel, Erik K.,3,641,222.

Regie Nationale des Usines Renault: *See—*
Colinet, Andre; Mercier, Jacques; and Pernoud, Claude, 3,640,457.

Reibig, Eric A., to All American Tool & Mfg. Co. Vibration force generator. 3,640,508, Cl. 259-72.

Reich, Heinz. Interchangeable drill support and actuating means for micro-drill. 3,640,636, Cl. 408-128.

Reicher, Milton D.: *See—*
Guark, Richard J.; and Reicher, Milton D.,3,641,437.

Reichhold Chemicals, Inc.: *See—*
Davis, Bernard J., 3,640,981.

Reick, Franklin G.: *See—*
Reick, Franklin G.; and Wilder, Joseph R., 3,641,332.

Reick, Franklin G.; and Wilder, Joseph R., 16% to Ebert, Michael, 28% to Picut, Frederick R., 28% to Reick, Franklin G., and 28% to Wilder, Joseph R. Fiber optics illumination system. 3,641,332, Cl. 240-1.

Reihs, Leonhard Hofheim: *See—*
Oberst, Hermann; Reihs, Leonhard Hofheim; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,836.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,830.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,833.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,834.

Reilly, Joseph R., to Monsanto Company. Apparatus for venting and releasing plastic articles from a blow mold. 3,640,671, Cl. 425-387.

Reimers, James L., to FMC Corporation. High speed article turning mechanism. 3,640,375, Cl. 198-33.

Rein, Burton M.: *See—*
Broderick, Edward J.; and Rein, Burton M.,3,641,120.

Reiner, Joel Russell; Preusch, William J.; and Davenport, William G., to Beaumont Birch Company. Incinerator shiftable closure gate. 3,640,233, Cl. 110-8.

Reiners, Walter: *See—*
Furst, Stefan, 3,640,477.

Reinhard, Hans; Petri, Rolf; and Beckerle, Wilhelm-Friedrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Molding materials based on elastomeric polymers and organic binders with or without mineral fillers. 3,640,912, Cl. 260-2.3

Reinhardt, James R.: *See—*
Smith, Jay Charles; and Reinhardt, James R.,3,640,682.

Reiss, Martin H.; and Cotter, William L., to Alarmtronics Engineering, Inc. Line security system. 3,641,547, Cl. 340-253.

Rembaum, Alan; and Hermann, Allen M., to California Institute of Technology. Pressure transducer. 3,641,470, Cl. 338-99.

Remley, Kenneth Herald: *See—*
Hermann, Divid Trimble; and Remley, Kenneth Herald,3,640,924.

Renauld, Fred S.; and Renauld, Noemie A. Low cost housing. 3,640,037, Cl. 52-169.

Renauld, Noemie A.: *See—*
Renauld, Fred S.; and Renauld, Noemie A.,3,640,037.

Reni, Cesare, to Societa' Italiana Resine S.p.A. Method of stabilizing polyethylene with anion exchange resins. 3,641,214, Cl. 260-897.

Reni, Cesare; and Lugo, Luigi, to Societa' Italiana Resine S.p.A. Process for regenerating spinning baths. 3,641,233, Cl. 264-179.

Republic Steel Corporation: *See—*
Main, George, 3,640,543.
Meyfarth, Herbert J.; and Crosby, John J., 3,640,112.
Reed, William A.; and Cole, Frank J., 3,640,762.
Ries, Gerald D.; and Poole, Sidney W., 3,640,690.

Research Corporation: *See—*
Lawrence, Willis G.; and Coffin, Leon B., 3,641,229.

Research Engineering Company: *See—*
Gulick, Ronald A.; and Wicke, Charles H., 3,640,140.

Reserv-A-Roll Co.: *See—*
Mott, Ralph B., Sr.; Mott, Ralph B., Jr.; and Cantella, Richard C., 3,639,944.

Resinoid Engineering Corporation: *See—*
Mann, Robert L., 3,640,068.

Restaino, Alfred J., to Atlas Chemical Industries, Inc. Acrylamide polymers as flocculants in recovery of nickel catalysts. 3,640,897, Cl. 252-412.

Reulet, Philippe; Pfister, Alain; Tellier, Jacques; Blanc, Jean-Henry; Jorgensen, Kirsten Borre; and Bohlbro, Hans, to Societe Nationale des Petroles d'Aquitaine. Catalytic process for the ammonoxydation of olefins. 3,641,102, Cl. 260-465.3

Revitz, Martin; and Turene, Francis E., to International Business Machines Corporation. Semiconductor device with beta tantalum-gold composite conductor metallurgy. 3,641,402, Cl. 317-234.

Reynolds Metals Company: *See—*
Wilson, Calvin L., 3,640,209.

Reynolds, Michael Leslie: *See—*
Coackley, Robert; Reynolds, Michael Leslie; and Rodgers, Clive Douglas,3,641,345.

Reynolds, R. J., Tobacco Company: *See—*
Pinkham, Jesse R., 3,640,287.

Reynolds, Roland Bruce: *See—*
Gersch, Richard C.; and Reynolds, Roland Bruce,3,640,633.

Rhees, Raymond C., to Kerr McGee Chemical Corporation. Dry, free-flowing proxygen composition with an organic acid anhydride and alkali metal hydrate. 3,640,885, Cl. 252-186.

Rhoads, Delmar D.; and Mac Kay, Robert H., to Lincoln Manufacturing Company. Supervisory and control system for food handling institutions. 3,641,263, Cl. 178-6.

Rhodes, Barry V. Automatic ball throwing machine. 3,640,263, Cl. 124-11.

Rhone-Poulenc S. A.: *See—*
Mourier, Emile, 3,640,851.

Rhone-Poulenc S.A.: *See—*
Farge, Daniel; Messer, Mayer Naoum; and Moutonnier, Claude, 3,641,127.

Ribbq Harry F.q Jr.: *See—*
Shank, Richard C.; Zucker, Carl E.; Jones, David H.; Ribbq Harry F.q Jr.; and Bayard, Robert T.,3,640,844.

Richard, Henry P., to Spalding, A. G., & Bros. Inc. Method of removing molding flash and the like from the surface of golf balls. 3,640,028, Cl. 51-289.

Richardson, Michael Alexander: *See—*
Rees, Donald Frank; Garnett, John Baron; and Richardson, Michael Alexander,3,640,076.

Richardson-Merrell Inc.: *See—*
Tilford, Charles H.; Blohm, Thomas R.; and MacKenzie, Robert D.,3,641,155.

Richart, Douglas Steven, to Polymer Corporation, The. Method of reducing sandiness in vinyl coatings. 3,640,747, Cl. 117-21.

Richman, Peter L. Harmonic-insensitive A.C.-to-D.C. converter. 3,641,420, Cl. 321-9.

Richter, Friedrich; and Steiner, Rudolf, to Scholl A. G. Apparatus for treating textiles. 3,640,103, Cl. 68-177.

Richter, Gerhard; and Schmid, Norbert. Apparatus for processing tanned hides. 3,640,105, Cl. 69-41.

Richter, Sidney B.; and Kaplan, Ephraim H., to Velsicol Chemical Corporation. O(S)-(2-Alkoxyimino-2-alkoxyethyl) (mono or dithio) phosphinates. 3,641,220, Cl. 260-944.

Richter, Sidney B.; and Krenzer, John, to Velsicol Chemical Corporation. N-Carbamoyl-o-alkenoyl-n-phenylhydroxyl-amines as herbicides. 3,641,143, Cl. 260-545.

Richterkessing, Frank H. Fluid operated machine and safety control system therefor. 3,640,007, Cl. 38-41.

Ricker, Ernst; Schmidt, Franz; and Schwartz, Erich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Thermal stability of copolymers of trioxane. 3,640,945, Cl. 260-45.7

Rider, Harold D.: *See—*
Argabright, Perry A.; and Rider, Harold D.,3,641,024.

Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., to Lummus Company, The. Hydrocarbon oxidation. 3,641,157, Cl. 260-599.

Ries, Gerald D.; and Poole, Sidney W., to Republic Steel Corporation. Welded steel articles bonded by a steel alloy. 3,640,690, Cl. 29-196.1

Riff, James A., to Motorola, Inc. Hydrodynamic charging system. 3,641,416, Cl. 320-61.

Rigby, Sherman, to Gordon Engineering Company. Low level detector and drop rate monitor, particularly for intravenous feeding apparatus. 3,641,543, Cl. 340-239.

Riggs & Lombard, Inc.: *See—*
Holm, William J., 3,640,099.
Wilcox, Harold R., 3,640,101.

Rijnders, Willem, to Hunter Douglas International Ltd. Panel holder for wall or ceiling finish with panels arranged on the supporting members. 3,640,033, Cl. 52-36.

Riken Piston Ring Ind. Co., Ltd.: *See—*
Suzuki, Kenzo; and Sasaki, Seiya, 3,640,700.

Riley Stoker Corporation: *See—*
Ferguson, Jeremiah M., 3,640,251.

Ringeman, Othmar E., to General Electric Company. Electron discharge device. 3,641,381, Cl. 313-40.

Ringland, William L.; and Kaeser, Ernst K., to Allis-Chalmers Manufacturing Company. Rotary inductor. 3,641,467, Cl. 336-5.

Rinke, Heinrich: *See—*
Thoma, Wilhelm; Oertel, Harald; Rinke, Heinrich; and Bahr, Ulrich,3,640,937.

Ripka, William Charles: *See—*
Boswell, George Albert, Jr.; and Ripka, William Charles,3,641,005.

Ripka, William Charles, to Du Pont de Nemours, E. I., and Company. Process for the preparation of steroid α- fluoronitrimines. 3,641,006, Cl. 260-239.55

Ripley, Charles C., to United States of America, Atomic Energy Commission. Dynamic seal. 3,640,845, Cl. 176-36.

Rippel, Wally E., to Electric Fuel Propulsion, Incorporated. SCR chopper circuit. 3,641,364, Cl. 307-240.

Ripper, Jose' E.: *See—*
Paoli, Thomas L.; and Ripper, Jose' E.,3,641,459.

Ritter, Ralph Kenneth; Pease, Charles C.; and Fay, Elliott J., to Omark Industries, Inc. Spud welding method. 3,641,305, Cl. 219-99.

Robbins, James S., and Associates, Inc.: *See—*
Watson, Frank George; and Sugden, David Burnet, 3,640,077.

Robbins, Max L.; and Brownawell, Darrell W., to Esso Research and Engineering Company. Microemulsion separation of organic compounds in liquid state. 3,641,181, Cl. 260-674.

Robbins, Murray; and Wolfe, Raymond, to Bell Telephone Laboratories, Incorporated. Ferrimagnetic semiconducting material and devices made therefrom. 3,640,864, Cl. 252-62.3

Roberts, Carleton W.: *See—*
Hall, Richard H.; Roberts, Carleton W.; Sikkema, Andrew J.; and Lawson, Junior J.,3,641,208.
Pews, Richard Garth; Hand, Clare R.; and Roberts, Carleton W.,3,641,160.

Roberts Dairy Company: *See—*
Roberts, James Gordon, 3,640,430.

Roberts, James Gordon, to Roberts Dairy Company. Bulk dispensing system. 3,640,430, Cl. 222-1.

Robertshaw, Fred C.; Bartos, Jon .; Hurst, James J.; and McGurty, James August, to United States of America, Atomic Energy Commission. High-temperature-strength, precipitation-hardenable, austenitic, iron-base alloys. 3,640,704, Cl. 75-128.

Robertson, Jack R. Method of inserting a suprapubic catheter. 3,640,281, Cl. 128-347.

Robertson, Reid S.: *See—*
Kemmer, Frank N.; Robertson, Reid S.; and Mattix, Rodney D.,3,640,820.

Robinson, Frank: *See—*
Betts, Max William; and Robinson, Frank,3,640,096.
Betts, Max William; and Robinson, Frank,3,640,097.

Rocchini, Albert G.; and Trautman, Charles E., to Gulf Research & Development Company. Electrical insulating oil. 3,640,868, Cl. 252-63.

Rochla, Kurt, to Windmoller & Holscher. Apparatus for forming heat-sealed end seams in tube sections of plastics material. 3,640,794, Cl. 156-583.

Rochow, Eugene G. Method for preparing alkoxy derivatives of silicon, germanium, tin, thallium and arsenic. 3,641,077, Cl. 260-429.

Rocket Research Corporation: *See—*
Forsythe, Alan K., 3,640,645.
Galbraith, Lyle D.; and Thron, William E., 3,640,083.

Rocks, Eugene S.; and Poff, Thomas J., to Sperry Rand Corporation. Light emitting semiconductor radial array. 3,641,400, Cl. 317-234.

Rodgers, Clive Douglas: *See—*
Coackley, Robert; Reynolds, Michael Leslie; and Rodgers, Clive Douglas,3,641,345.

Rodgers, John Leo, to American Cyanamid Company. Synergistic U.V. absorber combination for polypropylene-polyvinylpyridine blend. 3,641,213, Cl. 260-895.

Rodth, Joseph J., to Coca-Cola Company, The, mesne. Beverage dispenser for metering a plurality of liquids. 3,640,433, Cl. 222-129.2

Rogers, John J.; and Stratman, John A., to Lumidor Products Corporation. Traffic control light with means responsive to a power failure. 3,641,487, Cl. 340-46.

Rogers, Waldo I.: *See—*
McInnis, Andrew M.; Ballard, Louis M.; Rogers, Waldo I.; Kramer, David C.; and Nielsen, Robert A.,3,639,990.

Rogers, William A. Gate valve with improved seal assembly. 3,640,500, Cl. 251-326.

Rohdin, Howard A.: *See—*
Brown, Fred P., Jr.; and Rohdin, Howard A.,3,640,668.

Rohm and Haas Company: *See—*
Horrom, Bruce W.; Crovetti, Aldo J.; and Viste, Kenneth L., 3,640,699.
Mansfield, Richard C.; and Rainey, James L., 3,640,998.
Niederhauser, Warren Dexter; Belmares-Sarabia, Hector; and Bauer, William, Jr., 3,641,199.
Sherba, Samuel E.; Steigerwalt, Ronald B.; Faith, William T., Jr.; and Smythe, Carl V., 3,640,725.

Rohm Gesellschaft mit bescharankter Haftung: *See—*
Uhlig, Helmut; and Grampp, Ekkehard, 3,640,723.

Rohr Corporation: *See—*
Shiflet, Robert H., 3,639,961.

Rohrer, John D.: *See—*
Parker, Shirley L.; and Rohrer, John D.,3,640,423.

Rolland, Jacques R.; and Holme, John, to Ogilvie Flour Mills Company, Limited, mesne. Process for preparing dough and batters, and the flour and flour-based products. 3,640,730, Cl. 99-91.

Rolls Royce Limited: *See—*
Jubb, Albert, 3,640,032.
Kitching, Anthony George; and Brown, Mervyn, 3,640,357.
Lynas, Derek L.; and Cross, Walter G., 3,641,550.

Rolls-Royce Limited: *See—*
Britt, Jack; and Honey, Alfred John, 3,640,638.
Palfreyman, Jack; and Middleton, Henry Edward, 3,640,640.

Rolph, Donald L., to Singer Company, The. Flexible shell printing element. 3,640,369, Cl. 197-54.

Romanelli, Pat, to Ram Domestic Products Company. Air temperature control system. 3,640,455, Cl. 236-49.

Ronai, Kenneth S.; and Spanier, Henry C., to Nabisco, Inc. Instant oat cereal product. 3,640,728, Cl. 99-80.

Ronai, Kenneth S.; and Spanier, Henry C., to Nabisco, Inc. Instant oat cereal product. 3,640,729, Cl. 99-83.

Roney, Richard N.: *See—*
Giardini, Dante S.; Preston, George A.; and Roney, Richard N.,3,640,163.

Rootes Motors Limited: *See—*
Milner, Peter James; and Hodkin, Richard Keith, 3,640,587.

Rosenberg, Harold: *See—*
Bilow, Norman; and Rosenberg, Harold,3,640,959.
Bilow, Norman; and Rosenberg, Harold,3,640,963.

Rosenburgh, Norman J.: *See—*
Morse, John E.; and Rosenburgh, Norman J.,3,640,438.

Rosenheim, Richard. Process of preparing and applying an improved painting device. 3,640,791, Cl. 156-230.

Rosenthal, Sidney, to United States of America, Air Force. Pyrotechnic remote cutter. 3,640,169, Cl. 83-639.

Ross, John M.; White, Warren V.; and Wortman, Robert R., to Sunkist Growers, Inc. Gravity conveyor. 3,640,366, Cl. 193-7.

Rota-Matic, Inc.: *See—*
Boyce, Alden C., 3,640,338.

Roth, Harold H.: *See—*
Jones, Giffin D.; and Roth, Harold H.,3,640,909.

Rouchaud, Jean; and Seree De Roch, to Institut Francais du Petrole, des Carburants et Lubrifiants. Catalytic process for epoxidation of olefinic compounds in the presence of molecular oxygen. 3,641,066, Cl. 260-348.5

Roudabush, Robert L.; and Drummond, Linwood E., to Eastman Kodak Company. Propargyl esters of bicyclo[2.2.1]hept-5-ene- 2-carboxylic acid and bicyclo[2.2.1]heptane- 2-carboxylic acid. 3,641,108, Cl. 260-468.

Rowe, Robert L.; and Peccerill, Donald. Apparatus for extruding cyclindrical magnets. 3,640,657, Cl. 425-114.

Rowley, Edward Kenneth; and Waugh, Clayton Thomas, to Canadian Industries Limited. Sealing plastic film. 3,640,790, Cl. 156-251.

Royer, James M. Security device for sliding windows and doors. 3,640,559, Cl. 292-288.

Rozantsev, Eduard Grigorievich: *See—*
Skripko, Leonid Alexandrovich; Rozantsev, Eduard Grigorievich; and Polotovskaya, Lidia Grigorievna,3,641,091.

Rubery, Owens and Company Limited: *See—*
Marshall, John Stephen; and Turnbull, William S., 3,640,066.

Rubin, Edward L. Battery terminal guard. 3,641,480, Cl. 339-116.

Rubin, Fred K.; and Carmack, Carl J., to Lever Brothers Company. Process for preparing a light density bleach composition. 3,640,875, Cl. 252-99.

Ruckdeschel, Walter: *See—*
Hildebrandt, Peter; and Ruckdeschel, Walter,3,641,311.

Ruhl, Karl; Franck, Heinz-Gerhard; and Turowski, Johannes, to Rutgerswerke Aktiengesellschaft. Process for preparing 3,5-dimethylphenol from isophorone. 3,641,166, Cl. 260-621.

Ruhl, Rudolf, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Unit construction for turbine housing bottoms. 3,640,639, Cl. 415-219.

Rupert, Samuel J.; and Ziegler, William E., to Hoover Ball and Bearing Company. Apparatus for blow molding hollow articles. 3,640,667, Cl. 425-326.

Ruter, Lewis L. Holder. 3,640,494, Cl. 248-42.

Rutgerswerke Aktiengesellschaft: *See—*
Ruhl, Karl; Franck, Heinz-Gerhard; and Turowski, Johannes, 3,641,166.

Ruti Machinery Works, Ltd.: *See—*
Strauss, Edgar H., 3,640,313.
Strauss, Edgar H., 3,640,314.

Rutland Fire Clay Company: *See—*
Plumer, Lawrence H., 3,640,431.

Ryan, Arthur B.: *See—*
Pigage, Robert F.; Ryan, Arthur B.; and Smith, Robert E.,3,641,431.

Ryan, Charles W., to Lilly, Eli, and Company. 3,7-(Ring-substituted) cephalosporin compounds. 3,641,021, Cl. 260-243.

Ryan, Robert J., to RCA Corporation. Adhesion of nonconducting and conducting materials. 3,640,853, Cl. 204-15.

Rydlund, Paul H.: *See—*
Yancik, Joseph J.; Schulze, Roy E.; and Rydlund, Paul H.,3,640,784.

Safar, Frank, to Smith International, Inc. Tunneling machine. 3,640,573, Cl. 299-31.

Sakai, Shigeru: *See—*
Yamamoto, Hisao; Kitagawa, Sumio; Inaba, Shigeho; Sakai, Shigeru; Hirohashi, Toshiyuki; Maruyama, Isamu; Akatsu, Mitsuhiro; and Izumi, Takahiro,3,641,002.

Sakai, Tetsushi: *See—*
Watanabe, Yoshio; and Sakai, Tetsushi,3,640,806.

Sakakibara, Shigeru: *See—*
Shirai, Takeaki; Sakakibara, Shigeru; Noguchi, Masaaki; and Sumiyoshi, Masaharu,3,640,152.
Sumiyoshi, Masaharu; Sakakibara, Shigeru; Ito, Osamu; and Kato, Takaaki,3,640,151.

Sakamoto, Yasuhiko: *See—*
Sasaki, Hiroshi; Maruyama, Tatsuo; Kanzaki, Hisao; and Sakamoto, Yasuhiko,3,641,274.

Sakurai, Masao, 1/2 to Gilbreth International Corporation. Heat-shrinkable sheeve for closing a receptacle. 3,640,417, Cl. 215-83.

Saleck, Wilhelm: *See—*
Huckstadt, Harald; Saleck, Wilhelm; Randolph, August; Moll, Franz; and Ranz, Erwin,3,640,715.
Von Konig, Anita; Moll, Farnz; Muller-Bardorff, Wolfgang; and Saleck, Wilhelm,3,640,719.

Salle, Adelin E. G.: *See—*
Perrault, Jean; and Salle, Adelin E. G.,3,641,494.

Saltini, Fabrizio: *See—*
Cortona, Alessandro; Musso, Pietro; Saltini, Fabrizio; and Fiorenza, Giorgio,3,641,317.

Saltini, Fabrizio, to Olivetti, Ing., C. & C., S.p.A. Trammission terminal. 3,641,508, Cl. 340-172.5

Salzano, George H.: *See—*
Duncan, Richard D.; and Salzano, George H.,3,640,115.

Sampson, Ronald G., to Nalco Chemical Company. Compositions and processes for breaking petroleum emulsions. 3,640,894, Cl. 252-344.

Samsel, Frank J. Barrier for defining a swimming area. 3,640,073, Cl. 61-1.

Samuels, Samuel: *See—*
Samuels, Stanley J.; and Samuels, Samuel,3,639,922.

Samuels, Stanley J.; and Samuels, Samuel. Cushioned toilet seat. 3,639,922, Cl. 4-237.

Sander, Bruno; Schmidt, Franz; and Sperber, Heinrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Stabilizing polyacetals. 3,641,196, Cl. 260-849.

Sanders Associates, Inc.: *See—*
Longland, John R.; Williams, Roy M., Jr.; Sutton, Howard D.; and Scopelite, Thomas M., 3,641,324.

Sanders Assoicates, Inc.: *See—*
Misek, Victor A.; and Myers, Robert, 3,641,549.

Sandoz-Wander, Inc.: *See—*
Galantay, Eugene E.; and Ott, Hans, 3,641,133.

Sands, John L.: *See—*
Thomas, Robert M.; and Sands, John L.,3,641,041.

Sandstrom, Jan Olof, and Kjellin, Per Gunnar, said Sjellin assor. to said Sandstrom. Imidazoline-2-thiones. 3,641,049, Cl. 260-309.6

Sanera, Arthur E., to Motorola, Inc. Production of fine single lines and of discrete closely spaced fine lines. 3,640,197, Cl. 95-12.

Sankyo Company Limited: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Matsui, Katsuaki; Kuramada, Tomoyuki; Watanabe, Ichiro; and Ohta, Noriyuki, 3,640,928.

Sanner, Axel: *See—*
Krauch, Carl Heinrich; and Sanner, Axel,3,640,753.

Santa Barbara Research Center: *See—*
Buller, Joseph S.; Nagy, Michael J.; and Peterson, Eugene W., 3,640,091.

Santilli, Arthur A.; and Kim, Dong H., to American Home Products Corporation. 5,6,7,8-Tetrahydro-5-oxo-pyrido[2,3-d] pyrimidine-6-carbonitirles and related compounds. 3,641,027, Cl. 260-256.4

Santilli, Arthur A.: *See—*
Kim, Dong H.; and Santilli, Arthur A.,3,641,028.

Sargeant, Ralph G. Apparatus for treating liquids with high frequency electrical energy. 3,641,302, Cl. 219-10.65

Sarring, Ernest J., to Crawley Machinery Co. Book transferring apparatus. 3,640,372, Cl. 198-24.

Sartorio, Franco, to D.E.A. Digital Electronic Automation Societa per Azioni. Improvements relating to machines and apparatus having a support for guiding a movable member. 3,639,993, Cl. 33-174.

Sasaki, Hiroshi; Maruyama, Tatsuo; Kanzaki, Hisao; and Sakamoto, Yasuhiko, to Kokusai Denshin Denwa Co., Ltd., and Fujitsu Limited. Synchronization system for communication information in PCM time division multiple access communication system. 3,641,274, Cl. 179-15.

Sasaki, Seiya: *See—*
Suzuki, Kenzo; and Sasaki, Seiya,3,640,700.

Sassiver, Martin Leon: *See—*
Lewis, Benjamin Arthur; Sassiver, Martin Leon; an; Shepherd, Robert Gordon,3,641,015.

Sato, Suguru, to Nippondenso Kabushiki Kaishi. Rectifying means for three-phase alternation generators for use in vehicles and other transport facilities. 3,641,374, Cl. 310-68.

Sato, Yohihiro: *See—*
Maegawa, Harumi; Sato, Yohihiro; Furuhata, Yasuo; and Kiumi, Takayuki,3,641,522.

Satoda, Hajime: *See—*
Okamoto, Kenya; and Satoda, Hajime,3,640,673.

Satoh, Yuzuru: *See—*
Ishihara, Masao; Sugino, Osakazu; Nishina, Yoshio; Kohno, Isao; and Satoh, Yuzuru,3,640,721.

Saucy, Gabriel: *See—*
Pawson, Beverly Ann; and Saucy, Gabriel,3,641,156.

Savoca, Paul C.; and Marasco, Anthony D., to Nottingham, J. B., & Co., Inc. Separable plug. 3,641,478, Cl. 339-63.

Sawicki, Joseph J.: *See—*
Yates, Lester R.; Dorsey, Charles M., Jr.; Howell, John B.; Conklin, Winfred S.; Sawicki, Joseph J.; Shepherd, Reeves T.; and Soares, Silvio,3,641,434.

Sawmill Hydraulics, Inc.: *See—*
Helle, Gordon W., 3,640,323.

Sbarra, Ralph A. Hair threader. 3,640,289, Cl. 132-9.

Scanlon, Patricia M.; and Young, Elwyn Richard, to Grace, W. R., & Co. Process for preparing amidine salts. 3,641,103, Cl. 260-465.4

Schaefer, Charles F. Circulating device. 3,640,245, Cl. 118-259.

Schaefer, Robert H., to General Motors Corporation. Power train control system. 3,640,157, Cl. 74-869.

Schaeffer, Robert A., to Xerox Corporation. Xerographic reproducing apparatus. 3,640,615, Cl. 355-8.

Schafer, Heinz: *See—*
Sus, Oskar; Uhlig, Fritz; and Schafer, Heinz,3,640,992.

Schafer, Werner: *See—*
Dabritz, Erich; Schafer, Werner; Grewe, Ferdinand; and Scheinpflug, Hans,3,641,043.

Scharf, Hans-Dieter; Droste, Wilhelm; and Liebig, Rita, to Merck, E., Aktiengesellschaft. 4,5-Dichloro-1,3-dioxacyclopentenone. 3,641,057, Cl. 260-340.2

Scharf, Herbert D. Variable crimping eccentric press. 3,639,966, Cl. 29-203.

Scheiner, Bernard J.; Lindstrom, Ronald E.; and Henrie, Thomas A., to United States of America, Interior. Recovery of gold from carbonaceous ores. 3,639,925, Cl. 75-101.

Scheinhutte, Hans-Jurgen, to Precisa A.G. Rechenmaschinenfabrik. Selective printer employing inking spark discharge. 3,640,214, Cl. 101-45.

Scheinpflug, Hans: *See—*
Dabritz, Erich; Schafer, Werner; Grewe, Ferdinand; and Scheinpflug, Hans,3,641,043.
Hoffmann, Hellmut; and Scheinpflug, Hans,3,641,224.

Schelin, Carl O.; and Eisentraut, Arne L., to Woodward Governor Company. Method of forming a valve structure with O-ring seals. 3,639,972, Cl. 29-451.

Schellhammer, Carl-Wolfgang: *See—*
Bode, Klaus-Dieter; and Schellhammer, Carl-Wolfgang,3,641,023.

Schenbelen, David F.; and Cramer, Robert B., to Dow Chemical Company, The. Thermoplastic compositions for the preparation of inherently flexible, dimensionally-stable, solvent-w weldable sheet materials. 3,641,216, Cl. 260-897.

Schenectady Chemicals, Inc.: *See—*
Gonzenbach, Carlos T.; and Jordan, Manuel A., 3,640,977.

Schering Aktiengesellschaft: *See—*
Engelfried, Otto; Neumann, Friedmund; and Wiechert, Rudolf, 3,641,013.

Schering Corporation: *See—*
Toplis, John G., 3,641,017.
Toplis, John G., 3,641,147.

Schermuly, Alfred James. Firing mechanism for a pyrotechnic device. 3,640,012, Cl. 42-1.

Scherz, Abraham Isaac: *See—*
Litvin, Noel, 3,640,107.

Schick, John W.: *See—*
Gemmill, Robert M., Jr.; Schick, John W.; and Mobil Oil Corporation,3,640,870.

Schindler, Harvey D.: *See—*
Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C.,3,641,157.

Schindler, Walter; and Blattner, Hans, to Coba-Geigy Corporation. 10-(Aminomethyl)- and (aminoethyl)-dibenz[b,f] oxepins. 3,641,056, Cl. 260-333.

Schinkler, Walter, and Zust, Armin, to Geigy Chemical Corporation. 10-(Piperazinyl or hexahydrodiazepine) thieno [3,2-b][1,5]benzothiazepine. 3,641,031, Cl. 260-268.

Schinzel, Erich: *See—*
Frischkorn, Hans; Pintschovius, Ulrich; Schinzel, Erich; and Smerz, Otto,3,641,051.

Schleich, Nicholas P., to Matix Corporation, The. Scroll stripping method and apparatus. 3,640,480, Cl. 242-56.

Schlor, Hanshelmut, to Farbenfabriken Bayer Aktiengesellschaft. Process for the preparation of alkyl-thiono- phosphonic acid dichlorides. 3,641,141, Cl. 260-543.

Schlor, Hanshelmut; Hammann, Ingeborg; and Homeyer, Bernhard, tc Farbenfabriken Bayer Aktiengesellschaft. S-(2-Chloro-2-bromo-ethyl-(di) thio-phosphoric and phosphonic acid. 3,641,223, Cl. 260-961.

Schlumberger Technology Corporation: *See—*
Whitfill, William A., Jr., 3,640,181.

Schlup & Cie, S. A.: *See—*
Lederrey, Marc; and Grenchen, Canton, 3,640,065.

Schmerling, Louis, to Universal Oil Products Company. Process for the preparation of organic halides and organic ethers. 3,641,159, Cl. 260-611.

Schmerling, Louis; and Dombro, Robert A., to Universal Oil Products Company. Preparation of alcohols. 3,641,165, Cl. 260-618.

Schmid, Bruce K.: *See—*
Bull, Willard C.; and Schmid, Bruce K.,3,640,816.

Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgag; Fessmann, Heinz; and Hahn, Edeleried, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process and apparatus for crimping yarns and the like. 3,640,063, Cl. 57-140.

Schmid, Norbert: *See—*
Richter, Gerhard; and Schmid, Norbert,3,640,105.

Schmid, Rolf; Bucher, Ingrid; Fisch, Willy; and Batzer, Hans, to Ciba Limited. Thermocurable polyester-dieproxide compositions. 3,641,194, Cl. 260-835.

Schmidt, Franz: *See—*
Ricker, Ernst; Schmidt, Franz; and Schwartz, Erich,3,640,945.
Sander, Bruno; Schmidt, Franz; and Sperber, Heinrich,3,641,196.

Schmidt, Gerald W.: *See—*
Jones, Lawrence Temple; Schmidt, Gerald W.; and Smith, Jay, III,3,640,019.

Schmitt, Joseph Michael: *See—*
Holland, William Dean; Schmitt, Joseph Michael; and Griffith, Richard McDonald,3,641,197.

Schmuck, Fredric E.: *See—*
Schoepe, Adolf; and Schmuck, Fredric E.,3,640,404.

Schneider, John A.; and Moran, John B., to Dow Chemical Company, The. Extreme pressure lubricants containing dialkyl 1,2,2,2-tetrahaloethyl phosphates. 3,640,857, Cl. 252-49.9

Schnell, Hermann: *See*—
Krimm, Heinrich; Schnell, Hermann; and Lenz, Gunther,3,640,955.

Schnur, Joel M., to Monsanto Company. Compositions for sand core mold elements. 3,640,932, Cl. 260-29.3

Schoenwitz, Frank H. W., to Honeywell Inc. System for displaying values of conditions reported at a central station from various remote stations of a building air condition system. 3,641,530, Cl. 340-183.

Schoepe, Adolf; and Schmuck, Fredric E. Production assembly mechanism for telescopically assembled and interference formed parts including transfer arm mechanism. 3,640,404, Cl. 214-1.

Schofield, John Allan; and Delano, Roger A., to Union Carbide Corporation. Azeotropic cleaning solvents based on 1,1,2,2- tetrachloro-1,2-difluoroethane. 3,640,884, Cl. 252-171.

Scholl A. G.: *See*—
Richter, Friedrich; and Steiner, Rudolf, 3,640,103.

Scholten Research N.V.: *See*—
Beersma, Pieter Johannes Adrianus; and Veening, Albert Hendrik, 3,640,756.

Schommer, Alfred: *See*—
Oberst, Hermann; Leonhard, Hofheim; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,835.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,830.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,833.
Oberst, Hermann; Reihs, Leonhard; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,834.
Oberst, Hermann; Reihs, Leonhard Hofheim; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred,3,640,836.

Schora, Frank C., Jr.: *See*—
Lee, Bernard Shing-Shu; and Schora, Frank C., Jr.,3,640,016.

Schovee & Boston: *See*—
Verbridge, Ralph Gary, 3,640,583.

Schrader, Gerhard; Hammann, Ingeborg; and Stendel, Wilhelm, to Farbenfabriken Bayer Aktiengesellschaft. O-alkyl-O-aryl-thiolphosphoric acid esters. 3,641,221, Cl. 260-949.

Schramm, Jacob: *See*—
Ansuini, Frank Joseph; Schramm, Jacob; and Badia, Frank Arthur,3,640,781.

Schulz, Johann G. D.; and Seekircher, Richard, to Gulf Research & Development Company. Process for obtaining nitro benzophenones. 3,641,132, Cl. 260-517.

Schulz, Johann G. D.: *See*—
Onopchenko, Anatoli; Schulz, Johann G. D.; and Seekircher, Richard,3,641,135.
Onopchenko, Anatoli; Schulz, Johann G. D.; and Seekircher, Richard,3,641,136.

Schulze, Roy E.: *See*—
Yancik, Joseph J.; Schulze, Roy E.; and Rydlund, Paul H.,3,640,784.

Schuman, Ralph H., to Warner & Swasey Company, The. Machine tool spindle and control therefor. 3,640,632, Cl. 408-11.

Schurman, Walter R., to United States of America, Atomic Energy Commission. Method for making flexible electrical connections. 3,639,978, Cl. 29-628.

Schuster, Herbert: *See*—
Ott, Karl-Heinz; Schuster, Herbert; Meckel, Walter; Dinges, Karl; and Muller, Erwin,3,641,209.

Schutzner, Walter, to Koreska, W. Transfer copy process and material. 3,640,750, Cl. 117-362.

Schwalm, Bruce D.: *See*—
Webb, Bryant F.; and Schwalm, Bruce D.,3,640,473.

Schwartz, Charles W.; and Martini, Richard W., to Howmet Corporation. Method for surface treatment of nickel and cobalt base alloys. 3,640,815, Cl. 204-385.

Schwartz, Erich: *See*—
Ricker, Ernst; Schmidt, Franz; and Schwartz, Erich,3,640,945.

Schwartz, William H., to Lester Engineering Company. Injection molding machine with high frequency dielectric heater. 3,640,662, Cl. 425-174.

Schwartzbach, Morton. Hot stamping machines for roll marking cylindrical items. 3,640,213, Cl. 101-8.

Schwartzenberg, John W.: *See*—
Blum, Bernard; and Schwartzenberg, John W.,3,640,119.

Schwarz, Frank, to Barnes Engineering Company. Thermal imaging system with thermal image superimposed on a target scene. 3,641,348, Cl. 250-83.3

Schwarz, Karl H., to Puritan-Bennett Corporation. Roller-band device with diverging walls biasing means. 3,641,296, Cl. 200-153.

Schwarz, Robert J.: *See*—
Chien, James C. W.; and Schwarz, Robert J.,3,640,946.

Schwbezt & Salzey Machinenfabrik Aktiengesellschaft: *See*—
Landwehrkamp, Hans, 3,640,061.

Schweiss, Dieter; and Long, Loren M., to Parke, Davis & Company. Novel xanthine compounds and means for obtaining the same. 3,641,010, Cl. 260-240.

Schwing, Friedrich W.: *See*—
Verheul, Cornelis, 3,640,303.

Scopelite, Thomas M.: *See*—
Longland, John R.; Williams, Roy M., Jr.; Sutton, Howard D.; and Scopelite, Thomas M.,3,641,324.
Stockham, John D.; Townsend, Lawrence B.; Ohlhaber, Ronald L.; and Scopelite, Thomas M.,3,641,320.

Scott, James W., to Owens-Corning Fiberglas Corporation. Self cleaning hood structure. 3,640,793, Cl. 25-83.

Scott Paper Company: *See*—
Kitch, Paul E., 3,640,613.

Scott, Richard D., to Teletype Corporation. Inductor surge protection for transistors. 3,641,407, Cl. 317-43.

Scott, Robert T.: *See*—
Shmueli, Kalman; Scott, Robert T.; and Mills, Wallace R.,3,640,318.

Scott, Ward: *See*—
McKee, Clyde M.; Provenzino, Andrew V.; and Scott, Ward, 3,640,608.
McKee, Clyde M.; Provenzino, Andrew V.; and Scott, Ward, 3,640,609.

Scott, Ward: *See*—
McKee, Clyde M.; Provenzino, Andrew V.; and Scott, Ward,3,640,608.
McKee, Clyde M.; Provenzino, Andrew V.; and Scott, Ward,3,640,609.

Sealectro Corporation: *See*—
Berezowski, Jaroslaw, 3,641,286.

Searle G. D., & Co.: *See*—
Klimstra, Paul D., 3,641,068.

Searle, Norman; and Tatom, John W., to Lockheed Aircraft Corporation. Thrust reverser for asymmetric exhaust efflux deflection. 3,640,468, Cl. 239-265.29

Sebestyen, Laslo G.: *See*—
Varadi, Peter F.; and Sebestyen, Laslo G.,3,641,281.

Sedlarik, Jargslav; Havlas, Jiri; and Kostelecky, Premysl, to Elitex, Zavody textilniho strojirenstvi. Pneumatic circuit for controlling the feeding of yarn into a yarn magazine. 3,640,440, Cl. 226-34.

Sedor, Edward A.: *See*—
Culbertson, Billy M.; McKillip, William J.; and Sedor, Edward A.,3,641,145.

Seefluth, Charles L., to Phillips Petroleum Company. Tangentially sliding neck swaging mechanism. 3,640,665, Cl. 425-297.

Seekircher, Richard: *See*—
Onopchenko, Anatoli; Schulz, Johann G. D.; and Seekircher, Richard,3,641,135.
Onopchenko, Anatoli; Schulz, Johann G. D.; and Seekircher, Richard,3,641,136.
Schulz, Johann G. D.; and Seekircher, Richard,3,641,132.

Selke, Lynn A., to Eastman Kodak Company. Device for advancing an endless web of flexible strip material. 3,640,439, Cl. 226-32.

Sell, Richard Geoffrey: *See*—
Tustin, Arnold; and Sell, Richard Geoffrey,3,641,285.

Sellstedt, John H.; and Childress, Scott J., to American Home Products Corporation. N-sulfonylcarboxamide penicillins. 3,641,000, Cl. 260-239.1

Selman, Gordon Leslie; and Ellison, Peter James, to Johnson, Matthey & Co. Limited. Treatment of platinum group metals and alloys. 3,640,705, Cl. 75-172.

Selwitz, Charles M.: *See*—
Bacha, John D.; and Selwitz, Charles M.,3,641,168.

SEMIA S.A.: *See*—
Perrinet, Paul Marie, 3,640,458.

Sendt, Alfred, to Heye, Hermann. Method and apparatus for processing vitreous melt. 3,640,517, Cl. 263-11.

Sennewald, Kurt; Ohorodnik, Alexander; and Neumaier, Hubert, to Knapsack Aktiengesellschaft. Process for the manufacture of orthoformic acid alkylesters. 3,641,164, Cl. 260-615.

Seppala, Harold J.; and Benz, Gerhard, to Minnesota Mining and Manufacturing Company. Modified polyester film for punched tapes. 3,640,944, Cl. 260-40.

Seragnoli, Ariosto, to G.D. Societa in Accomandita Semplice di Enzo Seragnoli e Artosto Seragnoli. Device for arranging articles supplied in bulk and individually and sequentially delivering them in alignment to wrapping up machines. 3,640,373, Cl. 198-30.

Seree De Roch: *See*—
Rouchaud, Jean; and Seree De Roch,3,641,066.

Serrano, Francisco M., to Compagnie Francaise des Petroles. Devices and methods of connecting two inhabitable enclosures under water. 3,640,078, Cl. 61-69.

Shaheen, Joseph M.; and Simone, John, to North American Rockwell Corporation. Interstitial conductors between plated memory wires. 3,641,520, Cl. 340-174.

Shakesby, Leonard, to Esso Research and Engineering Company. Coupling for plastic pipe. 3,640,551, Cl. 285-39.

Shank, Richard C.; Zucker, Carl E.; Jones, David H.; Ribbq Harry F.q Jr.; and Bayard, Robert T., to United States of America, Atomic Energy Commission. Power-flattened seed-blanket reactor core. 3,640,844, Cl. 176-18.

Shapiro, Sandor: *See*—
McKee, Clyde M.; Provenzino, Andrew V.; and Scott, Ward, 3,640,608.
McKee, Clyde M.; Provenzino, Andrew V.; and Scott, Ward, 3,640,609.

Shatz, Abram; and Eisenberg, Ben, to Kriser Corporation. Photographic control apparatus. 3,640,620, Cl. 355-38.

Shavel, John, Jr.; and Farber, Sheldon, to Warner-Lambert Pharmaceutical Company. 3,4-Dihydronaphthalenoneoxy-2-hydroxy-propylamines. 3,641,152, Cl. 260-570.7

Shavel, John, Jr.: *See*—
Zinnes, Harold; Shavel, John, Jr.; and Lindo, Neil A.,3,641,032.

Sheehan, Gerard Martin, to American Cyanamid Company. Titanium dioxide pigment. 3,640,743, Cl. 106-300.

Sheets, Herbert D., Jr.: *See—*
Lankard, David R.; and Sheets, Herbert D., Jr.,3,640,737.

Sheetz, David P., to Dow Chemical Company, The. Stable aqueous dispersions. 3,640,922, Cl. 260-4.

Shell Oil Company: *See—*
Darley, Henry C. H., 3,640,343.
Feenstra, Robijn, 3,640,356.
Hop, Adrianus G., 3,640,134.
Nakamaye, Kay L.; Slaugh, Lynn H.; Spooncer, William W.; and Volger, Hendrik C., 3,641,170.
Neal, William J., 3,640,080.
Nihof, Hendrikus J.; and Borsboom, Albertus C. H., 3,640,120.
Spooncer, William W., 3,641,171.
Trainer, Richard P., 3,640,849.

Shelley Manufacturing Company: *See—*
House, Bruce F., 3,640,427.

Shemer, Raymond A.: *See—*
Gaines, Brian R.; and Shemer, Raymond A.,3,641,447.

Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L., to Merck & Co., Inc. Oxy substituted biphenylene carboxylic acids. 3,641,134, Cl. 260-520.

Shepherd, George E. Control means for copy sheet feeding and moistening means in address printing machines. 3,640,215, Cl. 101-53.

Shepherd, Lawrence H., Jr., to Ethyl Corporation. Vinylic alumina-cycloalkane compounds and their preparation. 3,641,084, Cl. 260-448.

Shepherd, Lawrence H., Jr., to Ethyl Corporation. Preparation of bis-alkenyl magnesium compounds. 3,641,186, Cl. 260-665.

Shepherd, Reeves T.: *See—*
Yates, Lester R.; Dorsey, Charles M., Jr.; Howell, John B.; Conklin, Winfred S.; Sawicki, Joseph J.; Shepherd, Reeves T.; and Soares, Silvio,3,641,434.

Shepherd, Robert Gordon: *See—*
Lewis, Benjamin Arthur; Sassiver, Martin Leon; and Shepherd, Robert Gordon,3,641,015.

Shepherd, Thomas H.: *See—*
Gould, Francis E.; and Shepherd, Thomas H.,3,641,237.

Sherba, Samuel E.; Steigerwalt, Ronald B.; Faith, William T., Jr.; and Smythe, Carl V., to Rohm and Haas Company. Soybean fractionation employing a protease. 3,640,725, Cl. 99-17.

Sherman, Gale K., to McDonnell Douglas Corporation. Multi-harness buckle. 3,639,948, Cl. 24-205.17

Sherwood Medical Industries Inc.: *See—*
Walker, Clarence L., 3,640,434.

Shevlin, Thomas S., to Minnesota Mining and Manufacturing Company. Integral heating elements. 3,640,764, Cl. 117-212.

Shick, Richard L.: *See—*
Trifunoxic, Alexander L.; Hodges, James R.; and Shick, Richard L.,3,641,234.

Shiflet, Robert H., to Rohr Corporation. Method and tool for securing a bearing race within a bore in a housing. 3,639,961, Cl. 29-149.5

Shigehara, Masamichi: *See—*
Kubo, Moritada; Shigehara, Masamichi; and Nogiwa, Yasuo,3,641,347.

Shilo, Alexander I.: *See—*
Crafford, Thomas J.; Shilo, Alexander I.; and Cary, Harry W., Jr.,3,640,164.

Shimizu, Sakae: *See—*
Kundo, Kishichiro; Iwata, Hiroo; Yamaguchi, Nario; Shimizu, Sakae; and Tubuko, Kazuo,3,640,709.

Shimomura, Yoshisada, to Yushin Seiki Kogyo Kabushiki Kaisha. Steering column lock for vehicles. 3,641,489, Cl. 340-52.

Shinozaki, Akira, to Konishiroku Photo Industry Co., Ltd. Exposure-control device in copying machines. 3,640,622, Cl. 355-65.

Shirai, Takeaki; Sakakibara, Shigeru; Noguchi, Masaaki; and Sumiyoshi, Masaharu, to Toyota Jidosha Kogyo Kabushiki Kaisha, and Nippon Denso Kabushiki Kaisha. Control for automatic transmission. 3,640,152, Cl. 74-752.

Shmueli, Kalman; Scott, Robert T.; and Mills, Wallace R., to International Controls Corporation. Method and apparatus for filling a thermal motor with wax. 3,640,318, Cl. 141-11.

Sholl, Herbert L., to Machlett Laboratories, Incorporated, The. Prestressed cathode structure for electron discharge devices. 3,641,387, Cl. 313-270.

Shotwell, Robert H., Jr. Collapsible shelter structure. 3,640,034, Cl. 52-70.

Showa Denko Kabushiki Kaisha: *See—*
Ogawa, Masao; Enjoji, Teruyuki; and Arai, Humio, 3,640,914.

Shramovich, Paul F.: *See—*
Altherr, Russell G.; Shramovich, Paul F.; and Metzger, Nelson D.,3,640,402.

Siai-Marchetti S.p.A.: *See—*
Monti, Giancarlo, 3,640,643.

Sibbett, Donald J.: *See—*
Anderson, Howard H.; Moyer, Rudolph H.; Sibbett, Donald J.; and Sutherland, David C.,3,640,624.

Sidline, George B., to Ampex Corporation. Apparatus for transporting a recording medium for storing information. 3,641,504, Cl. 340-172.5

Sieger, Maurice Paul, to United Engineering and Foundry Company. Casting apparatus with means for removing ingot on bottom mold element. 3,640,334, Cl. 164-269.

Siemens Aktiengesellschaft: *See—*
Hintringer, Otmar; Koniger, Walter; and Thorn, Jurgen, 3,641,351.

Sigman Industries, Inc.: *See—*
Weagant, William D., 3,641,253.

Signor, Gary R.: *See—*
Artz, Walter M.; Cornelius, Kenneth R.; Olson, John W.; Signor, Gary R.; and Slojkowski, Francis E.,3,641,505.

Sigrist, Hugo, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Loading tray for a rocket. 3,640,179, Cl. 89-1.801

Sigworth, Harrison W.: *See—*
Smith, Calvin S., Jr., 3,640,850.

Sikkema, Andrew J.: *See—*
Hall, Richard H.; Roberts, Carleton W.; Sikkema, Andrew J.; and Lawson, Junior J.,3,641,208.

Siler, William J. Pool rink conversion kit. 3,639,921, Cl. 4-172.11

Simmons, John Richard: *See—*
Neal, Francis John; Courtenay, Jerzy Leon; and Simmons, John Richard,3,640,092.

Simms, Michael L.: *See—*
Jacobus, Dwight W.; and Simms, Michael L.,3,640,088.

Simon, Myron S., to Polaroid Corporation. Polymers of dipyridyl. 3,641,034, Cl. 260-296.

Simone, John: *See—*
Shaheen, Joseph M.; and Simone, John,3,641,520.

Simons, Duane J.: *See—*
Kekish, George T.; James, William G.; and Simons, Duane J.,3,640,933.

Sims, Stuart Donald: *See—*
Duffy, Joseph J.; and Sims, Stuart Donald,3,641,307.

Sinclair Oil & Gas Company: *See—*
Bucaram, Salim M.; and Collings, Lawrence V., 3,640,824.

Singer Company, The: *See—*
Rolph, Donald L., 3,640,369.

Sissel, Harold N. Mechanically compensated zoom lens system. 3,640,605, Cl. 350-184.

Siwik, Anthony F., to Parker-Hannifin Corporation. Coupling for plastic tube. 3,640,554, Cl. 285-382.2

Six, Richard. Clutch controls for power take-off shafts of tractor or like vehicles. 3,640,362, Cl. 192-48.7

Size, Robert A. Immersion deep frier. 3,640,208, Cl. 99-408.

Skaperdas, Dominic O.: *See—*
Bitzer, Donald L.; Bandy, Lyle E.; Johnson, Roger L.; and Skaperdas, Dominic O.,3,641,529.

Skogsholm, Einar Aasen: *See—*
Graf, Carlton Eugene; Skogsholm, Einar Aasen; and Volkmann, Werner Karl,3,641,421.

Skripko, Leonid Alexandrovich; Rozantsev, Eduard Grigorievich; and Polotovskaya, Lidia Grigorievna. Method of preparing disubstituted di(p-arylamino- phenoxy) silanes. 3,641,091, Cl. 260-448.8

Skuttle Manufacturing Company: *See—*
Stiles, Walter R., 3,640,515.

Slanker, Daniel R.; and Slanker, Edwin E. Power driven reciprocating bone surgery instrument. 3,640,280, Cl. 128-317.

Slanker, Edwin E.: *See—*
Slanker, Daniel R.; and Slanker, Edwin E.,3,640,280.

Slater, William W.; and Thow, Lawrence E., to Celanese Coatings Company. Aqueous dispersions of epoxy resin esters and method of preparing same. 3,640,926, Cl. 260-18.

Slaugh, Lynn H.: *See—*
Nakamaye, Kay L.; Slaugh, Lynn H.; Spooncer, William W.; and Volger, Hendrik C.,3,641,170.

Slavin, Martin J., to Phonplex Corporation, mesne. Electronic voice annunciating system having binary data converted into audio representations. 3,641,496, Cl. 340-148.

Slavin, Peter E., to Intelligent Instruments, Inc. Display system. 3,641,554, Cl. 340-324.

Slaybaugh, Charles Jay: *See—*
Carter, William R.; Slaybaugh, Charles Jay; and Hodgins, Patrick M.,3,640,420.

Sloan, Cephas H.: *See—*
Touey, George P.; and Sloan, Cephas H.,3,640,742.

Slojkowski, Francis E.: *See—*
Artz, Walter M.; Cornelius, Kenneth R.; Olson, John W.; Signor, Gary R.; and Slojkowski, Francis E.,3,641,505.

Small, Isadore, III: *See—*
Elliot, William H.; and Small, Isadore, III,3,641,397.

Smarook, Walter H.: *See—*
Chow, Sui-Wu; and Smarook, Walter H.,3,640,838.
Lundberg, Robert Dean; Koleske, Joseph Victor; Pollart, Dale Flavian; and Smarook, Walter Henry,3,641,204.

Smernoff, Ronald B., to Oxford Laboratories. Chromatography method and apparatus. 3,640,687, Cl. 23-230.

Smerz, Otto: *See—*
Frischkorn, Hans; Pintschovius, Ulrich; Schinzel, Erich; and Smerz, Otto,3,641,051.

Smiley, David E.: *See—*
Case, Forrest N.; Garrison, Arthur W.; Kau, Donald L.; and Smiley, David E.,3,640,808.

Smith, Billy C.: *See—*
Ohntrup, Frederick F.; Truemper, John P.; and Smith, Billy C.,3,641,413.
Smith, Calvin S., Jr., 1/3 to Sigworth, Harrison W., and 1/3 to Finical, Thomas N., Jr. Process for producing fresh water from salt water. 3,640,850, Cl. 203-11.
Smith, Charles E.: *See—*
Cassano, James R.; Smith, Charles E.; and Kalvitis, Robert E.,3,640,614.
Smith, Clifford E.; and White, Bobby J., to Phillips Petroleum Company. Olefin isomerization. 3,641,184, Cl. 260-683.2
Smith, Edward A.; and Baldwin, Arnold V., to GAF Corporation. Pressurized liquid filtering apparatus. 3,640,392, Cl. 210-232.
Smith, George H., to Minnesota Mining and Manufacturing Company. Spectral sentization of photosensitive compositions. 3,640,718, Cl. 96-89.
Smith International, Inc.: *See—*
Safar, Frank, 3,640,573.
Smith, Jay Charles; and Reinhardt, James R., to Freeport Sulphur Company. Increasing the rate of reaction in reducing calcium sulfate to calcium sulfide. 3,640,682, Cl. 23-137.
Smith, Jay, III: *See—*
Jones, Lawrence Temple; Schmidt, Gerald W.; and Smith, Jay, III,3,640,019.
Smith, Joseph E., to Wolverine-Pentronix, Inc. Die and punch assembly for compacting powder and method of assembly. 3,640,654, Cl. 425-78.
Smith, Kenneth J. Universal gaff guard. 3,640,358, Cl. 182-221.
Smith Kline & French Laboratories: *See—*
Edgerton, William H., 3,641,149.
Stedman, Robert John, 3,641,148.
Smith, Paul E.: *See—*
Bunting, Henry E.; and Smith, Paul E.,3,641,254.
Smith, Randal E.; and Egbom, Clarence W., to Ideal Basic Industries, Inc. Reagents for beneficiating ores. 3,640,385, Cl. 209-166.
Smith, Robert E.: *See—*
Pigage, Robert F.; Ryan, Arthur B.; and Smith, Robert E.,3,641,431.
Smith, Thomas R., to Maytag Company, The. Method for molding waste disposer splash shield. 3,641,231, Cl. 264-155.
Smiths Industries Limited: *See—*
Constable, Geoffrey Ernest Patrick, 3,641,497.
Smurov, Georgy Sergeevich: *See—*
Makachev, Nikolai Ivanovich; Parshin, Alexei Nikolaevich; Smurov, Georgy Sergeevich; and Stepanets, Alexei Trofimovich,3,640,316.
Smythe, Carl V.: *See—*
Sherba, Samuel E.; Steigerwalt, Ronald B.; Faith, William T., Jr.; and Smythe, Carl V.,3,640,725.
Snodgrass, Earl D.: *See—*
Fuller, Ralph A.; and Snodgrass, Earl D., 3,640,190.
Snodgrass, Earl D.: *See—*
Fuller, Ralph A.; and Snodgrass, Earl D.,3,640,190.
Snyder, Alan K., to Chicago Display Company. Display stand and expandable shelf for use thereon. 3,640,389, Cl. 211-148.
Snyder, George E. Automatic baking oven for pretzels. 3,640,207, Cl. 99-327.
Soares, Silvio: *See—*
Yates, Lester R.; Dorsey, Charles M., Jr.; Howell, John B.; Conklin, Winfred S.; Sawicki, Joseph J.; Shepherd, Reeves T.; and Soares, Silvio,3,641,434.
Societa' Italiana Resine S.p.A.:*See—*
Reni, Cesare, 3,641,214.
Reni, Cesare; and Lugo, Luigi, 3,641,233.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Perna, Aldo; and de Varda, Giorgio, 3,641,275.
Societe Alsacienne de Constructions Atomiques de Telecommunications et d'Electronique 'Alcatel':*See—*
Brilman, Michel Edmond Francis; Campagne, Jean-Pierre Alain; and Gorinas, Guy Georges, 3,641,517.
Societe Anonyme dite: Bronzavia: *See—*
Malczewski, Jeremie, 3,640,464.
Societe Anonyme dite: Institut Merieux: *See—*
Galy, Michel, 3,640,437.
Societe Financiere Francaise de Licences et Brevets: *See—*
Potin, Marcel, 3,639,969.
Societe Nationale des Petroles d'Aquitaine:*See—*
Reulet, Philippe; Pfister, Alain; Tellier, Jacques; Blanc, Jean-Henry; Jorgensen, Kirsten Borre; and Bohlbro, Hans, 3,641,102.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation:*See—*
Citroen, Armand, 3,640,545.
Societe Rhodiaceta: *See—*
Boyer, Jacques, 3,640,060.
Grosjean, Pierre, 3,641,198.
Solomon, Jack M.: *See—*
Chisholm, Daniel R.; Solomon, Jack M.; and Isbitsky, Bernard,3,641,022.
Solomon, Milton, to Circle Engineering Co., Inc. Small vehicle wheel. 3,640,584, Cl. 301-63.
Sommer, Heinrich: *See—*
Peuker, Kurt; and Sommer, Heinrich,3,640,376.
Sonderegger, Hans Conrad: *See—*
Specha, Gelli; Martini, Karlheinz; and Sonderegger, Hans Conrad,3,640,130.
Sonnenfeld, Richard J.: *See—*
Trepka, William J.; and Sonnenfeld, Richard J.,3,640,988.
Sorrells, Frank D.: *See—*
Lee, Charles A.; and Sorrells, Frank D.,3,640,000.
Sosalla, Harry, to Noble Manufacturing Company. Foldable harrow cart. 3,640,345, Cl. 172-311.
Sotir, Piro. Marking pen. 3,640,631, Cl. 401-206.
Soupene, Pierre: *See—*
Frerson, Raymond; Gravier, Claude; Ravenel, Pierre; and Soupene, Pierre,3,640,621.
South African Inventions Development Corporation: *See—*
Polson, Alfred; and Katz, Woolf, 3,640,809.
Southbourne Rubber Company Limited: *See—*
Duncan, Leslie C. V., 3,640,496.
Space Tool, Inc.: *See—*
Halls, Kenneth F.; and Brickley, Alfred H., 3,640,159.
Spaenig, Hermann: *See—*
Adolphi, Heinrich; Steimmig, Anna; and Spaenig, Hermann,3,641,248.
Spalding, A. G., & Bros. Inc.: *See—*
Richard, Henry P., 3,640,028.
Spalding, James R., to General Electric Company. Friction coupling. 3,640,363, Cl. 192-65.
Spanel, Abram N. Color applicator for hair. 3,640,288, Cl. 132-9.
Spanier, Henry C.: *See—*
Ronai, Kenneth S.; and Spanier, Henry C.,3,640,728.
Ronai, Kenneth S.; and Spanier, Henry C.,3,640,729.
Spannlang, Ronald, to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft. Steel-converter handling vehicle. 3,640,503, Cl. 254-84.
Spanos, William M.; and Polgar, Michael S., to International Telephone and Telegraph Corporation. Disconc antenna. 3,641,578, Cl. 343-773.
Spataru, Nicolae: *See—*
Moisescu, Gheorghe; Stoica, Valer; Wolf, Carol; and Spataru, Nicolae,3,640,206.
Spencer, Harvey J.: *See—*
Nystrand, Ernst Daniel; Spencer, Harvey J.; and Ziegelhoffer, Paul,3,640,050.
Sperber, Heinrich: *See—*
Sander, Bruno; Schmidt, Franz; and Sperber, Heinrich,3,641,196.
Sperry Rand Corporation: *See—*
Allen, Terry S.; Lane, Lynn R.; and Swartz, Harold Lee, 3,640,137.
Kanitz, Roy Edwin, 3,640,596.
Rocks, Eugene S.; and Poff, Thomas J., 3,641,400.
Webb, Bryant F.; and Schwalm, Bruce D., 3,640,473.
Specha, Gelli; Martini, Karlheinz; and Sonderegger, Hans Conrad, to Kistler Instrumente AG. Force and moment arrangements. 3,640,130, Cl. 73-133.
Spicer, John Calvin: *See—*
Winslow, Alfred Edwards; and Spicer, John Calvin,3,640,841.
Spichala, Paul, to Fichtel & Sachs AG. Friction clutch assembly. 3,640,361, Cl. 192-70.18
Spiegelberg, Hans: *See—*
Kyburz, Emilio; and Spiegelberg, Hans,3,641,153.
Spinnett, Raymond G. Rotary internal combustion engine. 3,640,252, Cl. 123-8.31
Spire, Etiene: *See—*
Karinthi, Pierre; and Spire, Etiene,3,640,702.
Spooncer, William W.: *See—*
Nakamaye, Kay L.; Slaugh, Lynn H.; Spooncer, William W.; and Volger, Hendrik C.,3,641,170.
Spooncer, William W., to Shell Oil Company. Ethylene telomerization. 3,641,171, Cl. 260-658.
S.P.R.L. Stenuick Freres: *See—*
Stenuick, Marcel, 3,640,350.
Squassoni, Gino F.: *See—*
Egnaczak, Raymond K.; and Squassoni, Gino F.,3,640,616.
Stache, Ulrich: *See—*
Radscheit, Kurt; Stache, Ulrich; Haede, Werner; Fritsch, Werner; and Lindner, Ernst,3,641,009.
Staehlin, John H.; and Peon, Gilbert A., to United States of America, Air Force, mesne. Electrically precise slotted waveguide. 3,640,168, Cl. 83-444.
Stafford, Richard W.; and Cuckovic, Milenko, to Mallory, P. R., & Co., Inc. Combination speed reduction and escapement means. 3,640,142, Cl. 74-112.
Stahly, Eldon E.: *See—*
Frank, Victor S.; Lard, Edwin W.; and Stahly, Eldon E.,3,641,193.
Stahn, Georg, to Lindner, Herbert, GmbH, Firma. Device for adjusting the position of a grinding wheel relative to a workpiece. 3,640,024, Cl. 51-165.87
Staller Cabinet, Inc.: *See—*
Staller, Maurice F.; and Staller, Marvin A., 3,640,595.
Staller, Marvin A.: *See—*
Staller, Maurice F.; and Staller, Marvin A.,3,640,595.
Staller, Maurice F.; and Staller, Marvin A., to Staller Cabinet, Inc. Motorized mobile shelving units. 3,640,595, Cl. 312-198.
Stamicarbon N.V.: *See—*
deRooij, Abraham H., 3,641,150.

Standard Telephone and Cables Limited: *See—*
Woodward, Jack Thomas Armon; and Jordan, Edward Graham, 3,641,586.

Stanford, Roy A.: *See—*
Pittman, Ed P.; and Stanford, Roy A.,3,641,427.

Stanley Drug Products, Inc.: *See—*
Cook, Elton S.; and Berberich, Norbert J., Jr., 3,641,247.

Stanley, Edward B., to United States Steel Corporation. Method of producing electrical sheet steel with cube texture. 3,640,780, Cl. 148-111.

Stanway, David Neil: *See—*
Ellis, Bernard; Petrow, Valdimir; and Stanway, David Neil,3,641,008.

Star Industries, Inc.: *See—*
Ashton, Walter G., 3,639,936.

Star, Moe, to Northrop Corporation. Modular aircraft structures. 3,640,492, Cl. 244-124.

Starke, Hans, to K.D.G. Instruments Limited. Winding apparatus. 3,640,478, Cl. 242-18.

Starks, Charles M.: *See—*
Portwood, Owen, Jr.; Starks, Charles M.; and Washecheck, Paul H.,3,641,163.

Starr, Anthony J. Apparatus for forming a container with an integrally formed hollow hinged handle. 3,640,672, Cl. 425-387.

Starr, Arthur Tisso. Circuit arrangement for an electric discharge tube. 3,641,557, Cl. 340-324.

Stastny, Fritz: *See—*
Gaeth, Rudolf; Stastny, Fritz; Breu, Rudolf; and Gaertner, Friedhelm,3,640,837.

State of Israel: *See—*
Weinberger, Hershel, 3,640,368.

Stauffer Chemical Company: *See—*
Biranowski, Jerome B.; and Weil, Edward D., 3,641,202.
Epstein, Peter F., 3,641,245.
Kraft, Paul, 3,640,954.
Martin, Donald J., 3,641,054.

Stauffer, Reuben Laverne, to Bendix Corporation. Low drop voltage regulator. 3,641,423, Cl. 323-9.

Steckler, Steven Alan: *See—*
Limberg, Allen Leroy; and Steckler, Steven Alan,3,641,361.

Steckler, Steven Alan, to RCA Corporation. Sample-and-hold circuit. 3,641,258, Cl. 178-7.3

Steckler, Steven Alan, to RCA Corporation. Transistor signal translating stage. 3,641,448, Cl. 330-18.

Stedman, Robert John, to Smith Kline & French Laboratories. Aminopolycyclodecanes. 3,641,148, Cl. 260-563.

Steed, Willie L. Pi coupled low noise amplifier. 3,641,452, Cl. 330-176.

Steel Company of Canada, Limited, The: *See—*
Barclay, Allan Sangster, 3,640,175.

Steele, William Henry: *See—*
Glover, Peter David; Forshaw, Richard; and Steele, William Henry,3,640,253.

Steelman, Gerald E. Litter device. 3,639,926, Cl. 5-81.

Steetley (Mfg.) Ltd.: *See—*
Lythe, Revor Wilkinson; and Ashworth, Edward Arnold, 3,640,518.

Steffel, Ronald V.: *See—*
Hollingsworth, Gale C.; and Steffel, Ronald V.,3,641,451.

Steffey, David R.: *See—*
Hayes, Charles F.; and Steffey, David R.,3,640,469.

Steiger, Anton, to Sulzer Brothers, Ltd. Fuel injection system for an internal combustion piston engine. 3,640,466, Cl. 239-94.

Steigerwalt, Ronald B.: *See—*
Sherba, Samuel E.; Steigerwalt, Ronald B.; Faith, William T., Jr.; and Smythe, Carl V.,3,640,725.

Steimmig, Anna: *See—*
Adolphi, Heinrich; Steimmig, Anna; and Spaenig, Hermann,3,641,248.

Stein, Erich. Fin-propelled watercraft. 3,640,240, Cl. 115-28.

Steiner, Rudolf: *See—*
Richter, Friedrich; and Steiner, Rudolf,3,640,103.

Steiner, Russell I.: *See—*
Rast, Gustav E.; and Steiner, Russell I.,3,640,733.

Stendel, Wilhelm: *See—*
Schrader, Gerhard; Hammann, Ingeborg; and Stendel, Wilhelm,3,641,221.

Stenuick, Marcel, to S.P.R.L. Stenuick Freres. Pneumatic drill for boring. 3,640,350, Cl. 173-61.

Stepanets, Alexei Trofimovich: *See—*
Makachev, Nikolai Ivanovich; Parshin, Alexei Nikolaevich; Smurov, Georgy Sergeevich; and Stepanets, Alexei Trofimovich,3,640,316.

Stephan, Gerhard; Harst, Heinz; Laux, Gunter; and Kappes, Alfred, to NSU Motorenwerke Aktiengesellschaft, and Wankel G.m.b.H. Process for producing a wear-resistant surface on a workpiece. 3,640,799, Cl. 204-38.

Stephan, John T.; and Golick, Alex James, to Commercial Solvents Corporation. Protein adhesive compositions. 3,640,740, Cl. 106-138.

Stephens, Joe F., to General Electric Company. Anode electrode for electron discharge device. 3,641,380, Cl. 313-39.

Sterner, Russell L.; and Lowe, William L., to Grove Manufacturing Company. Safe load control system for telescopic crane booms. 3,641,551, Cl. 340-267.

Steru, Marius: *See—*
Braillard, Pierre L.; Moreuil, Jean-Louis; and Steru, Marius,3,640,002.

Stevens, Henry C., to PPG Industries, Inc. Polymerization of fluorine-containing ethylenically unsaturated monomers in the presence of a beta- hydroxyalkyl tertinary-butyl peroxide. 3,640,985, Cl. 260-92.1

Stevens, Laurence G.: *See—*
Klein, Lawrence C.; and Stevens, Laurence G.,3,640,684.

Stewart, Albert A. Golf practice flatform. 3,639,923, Cl. 273-187.

Stewart, Dair J., to Mautz Paint & Varnish Company. Fluorescent skin-marking composition. 3,640,889, Cl. 252-301.2

Stewart, Mary J.; and Price, John A., to FMC Corporation. Dibromoneopentyl glycol modified polyesters. 3,640,964, Cl. 260-75.

Stiles, Alvin B.: *See—*
Mc Clellan, William; and Stiles, Alvin B.,3,640,900.

Stiles, Walter R., to Skuttle Manufacturing Company. Humidifier drive. 3,640,515, Cl. 261-92.

Stilling, Jens Ole, to Aktiebolaget Asea-Atom. Level control means. 3,640,117, Cl. 73-1.

Stockburger, George J., to Atlas Chemical Industries, Inc. Polyhydroxy phosphate esters of halogenated phenol and halogenated aniline. 3,641,219, Cl. 260-929.

Stockdale, Geoffrey. Means for drawing together and aligning the separable parts of composite load-carrying vessels or watercraft. 3,640,238, Cl. 114-235.

Stockham, John D.; Townsend, Lawrence B.; Ohlhaber, Ronald L.; and Scopelite, Thomas M., to United States of America, Air Force. Raindrop counter. 3,641,320, Cl. 235-92.

Stoica, Valer: *See—*
Moisescu, Gheorghe; Stoica, Valer; Wolf, Carol; and Spataru, Nicolae,3,640,206.

Stoppard, William E.: *See—*
Nelson, John; and Stoppard, William E.,3,640,160.

Storage Technology Corporation: *See—*
Campbell, Ronald R.; and Monroe, Roger A., 3,641,277.

Stowe, Robert A.; and Martin, Irvin J., to Dow Chemical Company, The. Method of dehydrogenating compounds. 3,641,180, Cl. 260-669.

Straarup, Orla: *See—*
Moller, Aage; and Straarup, Orla,3,640,467.

Strakosch, Clarence P.: *See—*
Anastasio, Frank J.; Brundage, Clinton F.; and Strakosch, Clarence P.,3,640,407.

Strange, Carl P., and Liu, Gordon Y. T., to Dow Chemical Company, The. Sulfur-curable olefin polymer compositions. 3,641,211, Cl. 260-889.

Stratman, John A.: *See—*
Rogers, John J.; and Stratman, John A.,3,641,487.

Strauss, Edgar H., to Ruti Machinery Works, Ltd. Insertion element for inserting weft threads on a loom. 3,640,313, Cl. 139-12.

Strauss, Edgar H., to Ruti Machinery Works, Ltd., formerly Caspar Honegger. Shed-forming apparatus on a loom. 3,640,314, Cl. 139-12.

Strauss, Irvin: *See—*
Dabrush, Charles; and Strauss, Irvin,3,639,992.

Strickland, Barney R.: *See—*
Ilnycky), Stephan; Cole, John Charles O.; Feldman, Nicholas; and Strickland, Barney R.,3,640,691.

Strippoli, Francois: *See—*
Ferton, Jean-Yves; Hennebert, Jacques; and Strippoli, Francois,3,641,295.

Stromberg-Carlson Corporation: *See—*
Fassett, Matthew; and Unger, Phyllis S., 3,641,564.

Strott, David B.: *See—*
Trimble, Carter H.; and Strott, David B.,3,640,678.

Struth, Bert W.: *See—*
Kivlen, John A.; Struth, Bert W.; and Weiss, Clifford P.,3,641,190.

Stuart, Robert W. Rotary drill assembly. 3,640,352, Cl. 175-107.

Stuhmer, Werner: *See—*
Milkowski, Wolfgang; Stuhmer, Werner; and Von Eickstedt, Klaus-Wolf,3,641,125.

Stults, Richard L.; and Curry, Robert W., to Hughes Aircraft Company. Surveillance and intrustio detecting system. 3,641,266, Cl. 178-6.8

Stumphauzer, William C.: *See—*
Hogstrom, Edwin F.; Stumphauzer, William C.; and Nord, Eric T.,3,640,758.

Sturgis, Clifford M. Self-contained steam heating unit. 3,640,456, Cl. 237-7.

Sturm, Hans-Jurgen; and Mayer, Kurt, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Disperse water-insoluble benzeneazo-3-acetyl-or 3-propionyl-aninodiphenylamine dyestuffs. 3,640,996, Cl. 260-207.1

Su, Aaron Chung Liong, to Du Pont de Nemours, E. I., and Company. Rhodium based catalysts for the synthesis of 1,4- dienes. 3,640,898, Cl. 252-429.

Sues, Lawrence B., to United States of America, Air Force. Spectrum analyzer. 3,641,515, Cl. 340-173.

Sugahara, Takashi; Suzuki, Minoru; Fukunaga, Tadayuki; and Fukushima, Shozo, to Kawasaki Jukogyo Kabushiki Kaisha. Oil pressure controlling device for big inertial load. 3,640,069, Cl. 60-105.

Sugden, David Burnet: *See—*
Watson, Frank George; and Sugden, David Burnet,3,640,077.

Sugino, Osakazu: *See*—
Ishihara, Masao; Sugino, Osakazu; Nishina, Yoshio; Kohno, Isao; and Satoh, Yuzuru,3,640,721.

Sullivan, Raymond: *See*—
Anderson, Daniel Gustav; Gladding, Edward Karcher; and Sullivan, Raymond,3,641,104.

Sulzer Brothers, Ltd.: *See*—
Steiger, Anton, 3,640,466.

Sumitomo Chemical Company Limited: *See*—
Usamoto, Teruyoshi; and Okita, Taisuke, 3,641,215.

Sumitomo Chemical Company, Ltd.: *See*—
Yamamoto, Hisao; Kitagawa, Sumio; Inaba, Shigeho; Sakai, Shigeru; Hirohashi, Toshiyuki; Maruyama, Isamu; Akatsu, Mitsuhiro; and Izumi, Takahiro, 3,641,002.

Sumiyoshi, Masaharu: *See*—
Shirai, Takeaki; Sakakibara, Shigeru; Noguchi, Masaaki; and Sumiyoshi, Masaharu,3,640,152.

Sumiyoshi, Masaharu; Sakakibara, Shigeru; Ito, Osamu; and Kato, Takaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha, and Nippondenso Kabushiki Kaisha. Device for controlling in a stepwise manner hydraulic pressure of working oil for use with an automatic transmission having a torque-converter. 3,640,151, Cl. 74-731.

Sun Oil Company: *See*—
Lyons, James E., 3,641,174.
Moore, Robert E.; and Janoski, Edward J., 3,641,167.

Sunbeam Corporation: *See*—
Jackson, Wilbur C.; and Beck, William P., 3,639,984.
Kirwan, Warren J.; and Bruning, Elmer E., 3,639,941.

Sunkist Growers, Inc.: *See*—
Ross, John M.; White, Warren V.; and Wortman, Robert R., 3,640,366.

Sunners, Brian: *See*—
Hoogendoorn, Helen M.; Liberman, Herbert E.; Narken, Bernt; and Sunners, Brian,3,639,976.

Sus, Oskar; Uhlig, Fritz; and Schafer, Heinz, to Kalle Aktiengesellschaft. Naphthoquinone diazide sulfonic acid ester. 3,640,992, Cl. 260-141.

Susuki, Rinnosuke; Hoshi, Hiroshi; and Araki, Shinichi, to Raion Yushi Kabushiki Kaisha. Spray pump. 3,640,470, Cl. 239-333.

Sutherland, David C.: *See*—
Anderson, Howard H.; Moyer, Rudolph H.; Sibbett, Donald J.; and Sutherland, David C.,3,640,624.

Sutton, Howard D.: *See*—
Longland, John R.; Williams, Roy M., Jr.; Sutton, Howard D.; and Scopelite, Thomas M.,3,641,324.

Sutton Research Corporation: *See*—
Briskin, Theodore; and Ward, Geoffrey R., 3,640,285.

Suzuki, Kenzo; and Sasaki, Seiya, to Riken Piston Ring Ind. Co., Ltd. Process for producing aningot of chromium metal or chromium-base alloy. 3,640,700, Cl. 75-10.

Suzuki, Masaru; and Hyodo, Masayoshi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Combination turn-signal and hazard-warning signal system. 3,641,493, Cl. 340-81.

Suzuki, Minoru: *See*—
Sugahara, Takashi; Suzuki, Minoru; Fukunaga, Tadayuki; and Fukushima, Shozo,3,640,069.

Suzuki, Shigeyuki; Kaneda, Isamu; Takahashi, Masaaki; and Nagai, Hiroshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for preparing soluble polyimide by the polycondensation of mellophanic dianhydride, pyromellitic dianhydride, and an aromatic diamine, followed by imidation of the polycondensation product. 3,640,969, Cl. 260-78.

Suzuki, Toshio; and Kaneko, Toyo. Foldable chair set. 3,640,568, Cl. 297-232.

Suzuki, Yoshiaki: *See*—
Osugi, Kinichiro; Suzuki, Yoshiaki; Mori, Tokio; and Inamoto, Toshiharu,3,641,561.

Svedberg, Per, to Allmanna Svenska Elektriska Aktiebolaget. Thyristor circuit. 3,641,404, Cl. 317-235.

Svenska Ackumulator Aktiebolaget Jungner: *See*—
Falk, Sven Uno; and Alfelt, Lars-Goran, 3,640,772.

SW Industries, Inc.: *See*—
Mitchell, Paul J., Jr., 3,639,957.

Swart, Richard H., Sr. Humidifier control system. 3,640,265, Cl. 126-113.

Swartz, Harold Lee: *See*—
Allen, Terry S.; Lane, Lynn R.; and Swartz, Harold Lee,3,640,137.

Sweeney, Richard F.: *See*—
Anello, Louis G.; Boghosian, Edward Michael; Jones, Edward S.; Minhas, Pritam S.; Price, Alson K.; and Sweeney, Richard F.,3,641,083.

Sweeney, Robert. Disposable self-packaging dustpan kit. 3,639,937, Cl. 15-104.8

Sweeney, William A.: *See*—
Marquis, David M.; and Sweeney, William A.,3,641,131.

Sweeny, Keith H.; and Fischer, James R., to United States of America, Interior. Reductive degradation of halogenated pesticides. 3,640,821, Cl. 210-59.

Swift, Harold E., to Gulf Research & Development Company. Preparation of vinyl acetate. 3,641,121, Cl. 260-497.

Swift, Harold E.: *See*—
Ondrey, John A.; and Swift, Harold E.,3,641,138.

Sylvander, Frederick B., to Bendix Corporation, The. Solid state electroluminescent moving display device. 3,641,533, Cl. 340-198.

Sylvania Electric Products, Inc.: *See*—
Ashley, Albert H., 3,641,519.
Audesse, Emery G.; Griffin, Robert M.; Tartakoff, Alexander; and Gutta, John J., 3,641,386.
Ferri, John L.; and Mathers, James E., 3,639,932.

Syntex Corporation: *See*—
Fried, John H.; and Harrison, Ian T., 3,641,161.
Moffatt, John G., 3,641,055.

Szabo, J Lester: *See*—
Childress, Scott J.; and Szabo, J Lester,3,641,114.

Sze, Morgan C.: *See*—
Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C.,3,641,157.

Tagawa, Hazime, to Matsushita Electronics Corporation. Glow discharge tube for code display. 3,641,383, Cl. 313-109.5

Taguchi, Youichi; and Asano, Shinji, to Toyo Plywood Co., Ltd. Facing plywood having printed grain. 3,640,797, Cl. 161-60.

Tajiri, Hiromi: *See*—
Hamanaka, Yasushi; Tajiri, Hiromi; Etoh, Kuniomi; Furukawa, Kaoru; and Masai, Yukito,3,640,761.

Takahashi, Masaaki: *See*—
Suzuki, Shigeyuki; Kaneda, Isamu; Takahashi, Masaaki; and Nagai, Hiroshi,3,640,969.

Takahashi, Toshinaka: *See*—
Uzu, Keizo; Nakano, Kinichi; and Takahashi, Toshinaka,3,641,053.

Takashima, Seiichi: *See*—
Kinjo, Hisao; Iwabuchi, Yoshitaka; Takashima, Seiichi; Kato, Takotoshi; and Okano, Keigo,3,641,278.

Tanaka, Heiroku, to Matsuhita Electric Industrial Co., Ltd. Pull-push type switch. 3,641,292, Cl. 200-76.

Tanaka, Noritoshi: *See*—
Isobe, Hiroshi; Aoki, Hachiro; and Tanaka, Noritoshi,3,640,258.

Tanaka, Toshio: *See*—
Kanada, Takashi; and Tanaka, Toshio,3,640,381.

Taniguchi, Koichi, to Nippon Denso Kabushiki Kaisha. Automatic anti-skid braking system. 3,640,589, Cl. 303-21.

Tao Gosei Chemical Industry Co., Ltd.: *See*—
Ito, Hiroo; Nakamura, Seiichi; and Inoue, Hidemu, 3,640,902.

Tartakoff, Alexander: *See*—
Audesse, Emery G.; Griffin, Robert M.; Tartakoff, Alexander; and Gutta, John J.,3,641,386.

Taschenberg, Ernest J., to Koppers Company, Inc. Hydrodynamic lift-type face seal. 3,640,541, Cl. 277-96.

Tatom, John W.: *See*—
Searle, Norman; and Tatom, John W.,3,640,468.

Tauber, Elisha; and Murray, Maxwell John, to Commonwealth Scientific and Industrial Research Corporation. Glazing concrete. 3,640,754, Cl. 117-70.

Tautz, William Paul: *See*—
Beaman, Alden Gamaliel; Duschinsky, Robert; and Tautz, William Paul,3,641,047.

Taylor, Brian; and Parry, Philip James, to International Nickel Company, The. Heat treatment of high chromium alloys to improve ductility. 3,640,777, Cl. 148-13.

Taylor, Elmer N., to Hughes Aircraft Company. Noise suppressor for surveillance and intrusion detecting system. 3,641,257, Cl. 178-6.8

TDK Electronics Company Ltd.: *See*—
Ezaki, Joichiro, 3,641,521.

Technical Operations, Incorporated: *See*—
Bouche, Edmund L., 3,640,711.

Tee-Pak, Inc.: *See*—
Oppenheimer, Seymour; and Turbak, Albin F., 3,640,734.
Oppenheimer, Seymour; and Turbak, Albin F., 3,640,735.

Te'Eni, Moshe, to National Research Development Corporation. Testing of concrete. 3,640,126, Cl. 73-88.

TEFA Industri Aktiebolag: *See*—
Larsson, Hans Tord E., 3,640,540.

Tefft, Edward G., to General Electric Company. Glass encapsulated semiconductor device fabrication process. 3,639,975, Cl. 29-580.

Teijin Limited: *See*—
Ichikawa, Yataro; and Yamanaka, Yoshiyuki, 3,641,112.
Ozawa, Shuji; and Fujie, Hiroshi, 3,640,970.

Tektronix, Inc.: *See*—
Griffin, John R., 3,641,555.

Teledyne, Inc.: *See*—
Foley, William R., Jr., 3,640,114.

Telefunken Patentverwertungsgesellschaft m.b.H.: *See*—
Herold, Wolf; and Ohnsorge, Horst, 3,641,273.

Telesco Brophey Limited: *See*—
Bremshey, Fritz, 3,640,297.
Weber, Heinz, 3,640,298.

Teletype Corporation: *See*—
Babler, Egon S., 3,641,262.
Cless, Gerhard; and De Boo, Jerome L., 3,641,583.
Denley, Ronald S., 3,640,370.
Gen, David G., 3,640,118.
Metz, Jack L., 3,641,588.
Scott, Richard D., 3,641,407.

Tellier, Jacques: *See*—
Reulet, Philippe; Pfister, Alain; Tellier, Jacques; Blanc, Jean-Henry; Jorgensen, Kirsten Borre; and Bohlbro, Hans,3,641,102.

Tempel, Albert: *See*—
Van der Kerk, Gerrit Johann Meine; and Tempel, Albert,3,641,078.

Templeborough Rolling Mills Limited: *See*—
Ashton, George Walker; and Ashton, John Congreve, 3,640,109.
Temple, John J. Reverse angle thread system for containers. 3,640,416, Cl. 215-43.
Tenna Corporation: *See*—
Tolar, James H., 3,640,538.
Tennant Company: *See*—
Carlson, Alfred D.; and Kasper, Joseph G., 3,639,940.
Tenneco Chemicals, Inc.: *See*—
Deinet, Adolph J.; and Klein, David X., 3,641,158.
Minieri, Pasquale Paul, 3,641,050.
Tension Structures Co.: *See*—
Huddle, Carl F., 3,640,296.
Terada, Yukio: *See*—
Kawamata, Tadashi; Hirota, Eiichi; Mihara, Toshihiro; and Terada, Yukio,3,640,871.
Termin, Eric; and Ismail, Roshdy, to Dynamit Nobel AG. Process for the manufacture of titanic esters. 3,641,079, Cl. 260-429.5
Texaco Inc.: *See*—
Harr, Stephen J., 3,640,858.
Kolaian, Jack H., 3,640,825.
Wiley, Morris A.; Lacoste, Roger G.; Henry, Clemence J.; and Waldbillig, James O., 3,640,872.
Texas Iron Works, Inc.: *See*—
Braddick, Britt O.; Lindsey, Hiram E., Jr.; and McKiearnan, Charles J., 3,640,341.
Textron, Inc.: *See*—
Howe, Ralph S., Jr., 3,640,592.
Voronoff, George N., 3,641,579.
Thee, Alfred: *See*—
Brecker, Lawrence R.; and Thee, Alfred,3,640,953.
Theis, Kathleen. Apparatus for curling eye lashes. 3,640,290, Cl. 132-32.
Thelen, Charles O.; and Ziegler, Hans J., to Western Electric Company, Incorporated. Bracket for mounting apparatus. 3,640,493, Cl. 248-27.
Theodoridis, George Constantin. Ring monitor. 3,641,582, Cl. 346-21.
Thermalloy Incorporated: *See*—
Hartman, John H., 3,640,399.
Thienel, Peter: *See*—
Linde, Hans; and Thienel, Peter,3,640,193.
Thoma, Wilhelm; Oertel, Harald; Rinke, Heinrich; and Bahr, Ulrich, to Farbenfabriken Bayer Aktiengesellschaft. Linear, segmented polyurethane elastomers. 3,640,937, Cl. 260-30.8
Thomas, Ian M.: *See*—
Levene, Leon; and Thomas, Ian M.,3,640,093.
Thomas, John E.: *See*—
Crowhurst, David B.; and Thomas, John E.,3,641,464.
Thomas, Klaus: *See*—
Ost, Walter; Thomas, Klaus; Jerchel, Dietrich; and Linden, Gerbert,3,641,062.
Thomas, Manuel A. Preparing panent press garments by treating with composition therefor. 3,640,675, Cl. 8-115.6
Thomas, Robert J.: *See*—
Tomalia, Donald A.; and Thomas, Robert J.,3,640,957.
Thomas, Robert M.; and Sands, John L., to Great Lakes Chemical Corporation. Dipyridylium quaternary dihalide halogen complexes. 3,641,041, Cl. 260-296.
Thompson, Burton J.; and Eide, Melvin O., to United Control Corporation. Transducer system with floating input circuit and constant current output electronics. 3,641,414, Cl. 318-662.
Thompson, Francis T. Alarm system. 3,641,570, Cl. 340-409.
Thompson, James O.: *See*—
Champ, Robert B.; Jurgens, Henry A.; and Thompson, James O.,3,640,714.
Thompson, John T.; and Gillemot, George W. Safety package assembly and divider clamp therefor. 3,639,952, Cl. 24-255.
Thomson, Lois J.: *See*—
Elliott, Melvin R., 3,640,378.
Thomson-CSF: *See*—
Brun, Henri; and Meilleroux, Jean-Louis, 3,641,426.
Picquendar, Jean Edgar; and Torguet, Roger, 3,641,513.
Thorn, Jurgen: *See*—
Hintringer, Otmar; Koniger, Walter; and Thorn, Jurgen,3,641,351.
Thow, Lawrence E.: *See*—
Slater, William W.; and Thow, Lawrence E.,3,640,926.
Throckmorton, Morford C., to Goodyear Tire & Rubber Company, The. Binary catalyst system for the polymerization of diolefins. 3,640,989, Cl. 260-99.3
Thron, William E.: *See*—
Galbraith, Lyle D.; and Thron, William E.,3,640,083.
Thylefors, Henric Wilhelm, to Alfa-Laval AB. Centrifugal separator. 3,640,452, Cl. 233-1.
Tilford, Charles H.; Blohm, Thomas R.; and MacKenzie, Robert D., to Richardson-Merrell Inc. Allene polyamines. 3,641,155, Cl. 260-583.
Time, Incorporated: *See*—
Means, John A., 3,640,843.
Tirrell, Clifford F.: *See*—
Price, Raymond E.; and Tirrell, Clifford F.,3,639,968.
Tisdale, Alfonso, to Deering Milliken Research Corporation. Warp beam let-off. 3,640,315, Cl. 139-107.
Toa Gosei Chemical Industry Co., Ltd.: *See*—
Kundo, Kishichiro; Iwata, Hiroo; Yamaguchi, Nario; Shimizu, Sakae; and Tubuko, Kazuo, 3,640,709.
Toby, Dennis E.: *See*—
Raab, Lester R.; and Toby, Dennis E.,3,640,203.
Tocquec, Yves, to Compagnie Generale d'Electricite. Scanning antenna having a spherical main reflector with moveable subreflector. 3,641,577, Cl. 343-754.
Todd, Herbert E.: *See*—
Winfree, Jules P.; Todd, Herbert E.; and McComas, Charles C.,3,640,778.
Tojyo, Ken: *See*—
Inoue, Masahiko; and Tojyo, Ken,3,639,951.
Tokyo Roki Kabushiki Kaisha: *See*—
Ochiai, Tuguo, 3,640,839.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Kubo, Moritada; Shigehara, Masamichi; and Nogiwa, Yasuo, 3,641,347.
Tokyo Sokuhan Co., Ltd.: *See*—
Isobe, Masahide, 3,640,600.
Tolar, James H., to Tenna Corporation. Universal tape recorder and play back instrument. 3,640,538, Cl. 274-4.
Tollet, Gunnar. Record medium and a method for storage of information. 3,641,318, Cl. 235-61.12
Tomalia, Donald A.; and Thomas, Robert J., to Dow Chemical Company, The. Monooxazoline and oxazine cured epoxy resins. 3,640,957, Cl. 260-47.
Tomiyasu, Hiroshi; Inagaki, Tsuguya; Kajiura, Hiroshi; and Watanabe, Kinnosuke. Device for measuring flow rates of powdery and granular materials. 3,640,135, Cl. 73-228.
Tonne, Friedrich. Checking device for checking the presence of personnel. 3,641,321, Cl. 235-92.
Toops, Emory Earl, Jr., to Commercial Solvents Corporation. Noncaking, grained ammonium nitrate. 3,640,697, Cl. 71-27.
Topliss, John G., to Schering Corporation. Thieno[1,2,4]thiadiazines. 3,641,017, Cl. 260-243.
Topliss, John G., to Schering Corporation. 2-Polyfluoroloweralkyl benzophenones. 3,641,147, Cl. 260-562.
Torguet, Roger: *See*—
Picquendar, Jean Edgar; and Torguet, Roger,3,641,513.
Torite Enterprises, Inc.: *See*—
Goy, Thomas J.; Knieriemen, Richard P.; and Reading, James E., 3,640,390.
Touey, George P.; and Sloan, Cephas H., to Eastman Kodak Company. Plasticizer blend for cellulose esters. 3,640,742, Cl. 106-179.
Touzinsky, Gerald F.; and Maurer, Hans W., to Westvaco Corporation. Process for the simultaneous gelatinization and graft copolymerization of monomers onto starch. 3,640,925, Cl. 260-17.4
Townsend, Lawrence B.: *See*—
Stockham, John D.; Townsend, Lawrence B.; Ohlhaber, Ronald L.; and Scopelite, Thomas M.,3,641,320.
Toyo Boseki Kabushiki Kaisha: *See*—
Hamanaka, Yasushi; Tajiri, Hiromi; Etoh, Kuniomi; Furukawa, Kaoru; and Masai, Yukito, 3,640,761.
Inamura, Seiichi; Kondo, Yusuke; Akita, Minoru; and Chikanari, Kenichi, 3,640,509.
Toyo Denki Seizo Kabushiki Kaisha: *See*—
Hirose, Kengo; Ishiwata, Noboru; and Hukawa, Tadaomi, 3,641,394.
Toyo Engineering Corporation: *See*—
Konoki, Keizo; and Ohsaki, Kozo, 3,640,052.
Toyo Plywood Co., Ltd.: *See*—
Taguchi, Youichi; and Asano, Shinji, 3,640,797.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Inoue, Masahiko; and Tojyo, Ken, 3,639,951.
Shirai, Takeaki; Sakakibara, Shigeru; Noguchi, Masaaki; and Sumiyoshi, Masaharu, 3,640,152.
Sumiyoshi, Masaharu; Sakakibara, Shigeru; Ito, Osamu; and Kato, Takaaki, 3,640,151.
Tozawa, Seiichi: *See*—
Miyazaki, Kazuhide; and Tozawa, Seiichi,3,640,683.
Trainer, Richard P., to Shell Oil Company. Spent shale retort with sonic oscillator clinker cutter. 3,640,849, Cl. 196-124.
Trans-Horizons, Inc.: *See*—
Wolf, Jesse David, 3,640,199.
Transalarm Electronics, Inc.: *See*—
Cutler, Joel L.; and Glickman, Joel L., 3,641,425.
Traube, Robert J., to FMC Corporation. Conveyor system. 3,640,412, Cl. 214-152.
Trautman, Charles E.: *See*—
Rocchini, Albert G.; and Trautman, Charles E.,3,640,868.
Tredwell, Gilman: *See*—
Koch, Robert L., II; and Tredwell, Gilman,3,640,814.
Trepanier, Donald L.; and Krieger, Paul E., to Dow Chemical Company, The. Thiazolo-as-triazines. 3,641,019, Cl. 260-248.
Trepka, William J.; and Sonnenfeld, Richard J., to Phillips Petroleum Company. Process for the polymerization of conjugated dienes with haloaryllithium initiators. 3,640,988, Cl. 260-94.2
Tri W-G Inc.: *See*—
Wieland, Roman G.; Weber, A. John; Bearfield, Clair A.; and Cole, Raymond, 3,640,520.
Trifunoxic, Alexander L.; Hodges, James R.; and Shick, Richard L., to Bancroft, Joseph, & Sons Co. Mechanical treatment of material. 3,641,234, Cl. 264-282.
Trimble, Carter H.; and Strott, David B., to Molybdenum Corporation. Yttrium purification process. 3,640,678, Cl. 23-22.

Troemel, Gerhard: *See—*
Ziemann, Heinz; Lehmann, Wolfgang; and Troemel, Gerhard,3,640,840.
Trowbridge, James L. Foldable boats. 3,639,933, Cl. 9-2.
Troxel Manufacturing Company: *See—*
Worley, George W., 3,640,548.
Truemper, John P.: *See—*
Ohntrup, Frederick F.; Truemper, John P.; and Smith, Billy C.,3,641,413.
TRW Inc.: *See—*
Kuykendall, James H., 3,641,424.
TRW Semiconductors Inc.: *See—*
Bailey, Robert F., 3,640,783.
Tubuko, Kazuo: *See—*
Kundo, Kishichiro; Iwata, Hiroo; Yamaguchi, Nario; Shimizu, Sakae; and Tubuko, Kazuo,3,640,709.
Tullman, Gerald M.: *See—*
Bachman, Gustave B.; and Tullman, Gerald M.,3,641,122.
Tummala, Rao R.: *See—*
Detweiler, John R., Jr.; and Tummala, Rao R.,3,640,738.
Tummarello, Natale J. Means for mounting concrete structural members. 3,640,328, Cl. 151-41.7
Turbak, Albin F.: *See—*
Oppenheimer, Seymour; and Turbak, Albin F.,3,640,734.
Oppenheimer, Seymour; and Turbak, Albin F.,3,640,735.
Turene, Francis E.: *See—*
Revitz, Martin; and Turene, Francis E.,3,641,402.
Turk, James R., to Marine Electro Mechanical, Inc. Horsepower meter. 3,640,131, Cl. 73-136.
Turnbull, William S.: *See—*
Marshall, John Stephen; and Turnbull, William S.,3,640,066.
Turner Brothers Asbestos Company Limited: *See—*
Darling, Thomas W., 3,640,929.
Turner, Leonard; Howman, Eric James; and Bradshaw, Christopher Patrick Cadman, to British Petroleum Company Limited, The. Disproportionation of olefines. 3,641,189, Cl. 260-683.
Turowski, Johannes: *See—*
Ruhl, Karl; Franck, Heinz-Gerhard; and Turowski, Johannes,3,641,166.
Tustin, Arnold; and Sell, Richard Geoffrey, to British Railways Board. Trolley wire overhead electric supply systems for electrically powered vehicles. 3,641,285, Cl. 191-40.
Twist, Douglas: *See—*
Giddings, David George; and Twist, Douglas,3,640,694.
Ube Industries, Ltd.: *See—*
Yamada, Keisho; Nagai, Shigeki; Odan, Kyoji; Nakamura, Yasuo; and Hidaka, Mijio, 3,641,100.
Yamada, Keisho; Nagai, Shigeki; Odan, Kyoji; Arima, Yasutaka; and Hidaka, Mikio, 3,641,101.
Uhlig, Fritz: *See—*
Sus, Oskar; Uhlig, Fritz; and Schafer, Heinz,3,640,992.
Uhlig, Helmut; and Grampp, Ekkehard, to Rohm Gesellschaft mit bescharankter Haftung. Enzymatic treatment of soya meal. 3,640,723, Cl. 99-9.
Uhrick, David A.: *See—*
Box, E O., Jr.; and Uhrick, David A.,3,641,182.
Unger, Phyllis S.: *See—*
Fassett, Matthew; and Unger, Phyllis S.,3,641,564.
Unicorn Industries, Inc.: *See—*
Phillips, Lawrence, Jr., 3,641,472.
Union Carbide Corporation: *See—*
Brode, George Lewis; and Pickering, Timothy Lee, 3,640,965.
Chow, Sui-Wu; and Smarook, Walter H., 3,640,838.
Lundberg, Robert Dean; Koleske, Joseph Victor; Pollart, Dale Flavian; and Smarook, Walter Henry, 3,641,204.
Matzner, Markus, 3,641,200.
Papa, Anthony Joseph; and Proops, William Robert, 3,640,911.
Peck, David W.; and Gentry, Robert R., 3,641,115.
Pickert, Paul Eugene, 3,640,681.
Schofield, John Allan; and Delano, Roger A., 3,640,884.
Union Oil Company of California: *See—*
Backlund, Peter Stanley, 3,640,698.
Booth, Frank B., 3,641,076.
Fenton, Donald M., 3,641,071.
Fenton, Donald M., 3,641,074.
Fenton, Donald M., 3,641,137.
Uniroyal, Inc.: *See—*
Lauchlan, Robert L., 3,641,207.
United Aircraft Corporation: *See—*
Biancardi, Frank R.; and Melikian, Gorken, 3,641,453.
Brown, Clyde O.; and Bullis, Robert H., 3,641,457.
Galasso, Francis S.; and Veltri, Richard D., 3,640,693.
Winfree, Jules P.; Todd, Herbert E.; and McComas, Charles C., 3,640,778.
United Control Corporation: *See—*
Thompson, Burton J.; and Eide, Melvin O., 3,641,414.
United Engineering and Foundry Company: *See—*
Sieger, Maurice Paul, 3,640,334.
United Kingdom Atomic Energy Authority: *See—*
Horsley, Geoffrey Winton; and Burnett, Ronald Cyril, 3,641,227.
Mc Cormick, Andrew, 3,641,339.
United Piece Dye Works, The: *See—*
Blount, Charles, Jr.; and Crandall, Nelson, 3,640,102.
United States of America
Agriculture: *See—*
Marvel, Carl S.; and Chow, Roberta C. L., 3,640,927.
Air Force: *See—*
Bilow, Norman; and Rosenberg, Harold, 3,640,959.
Bilow, Norman; and Rosenberg, Harold, 3,640,963.
Boothe, Willis A.; and Bottone, Salvatore, Jr., 3,640,300.
Bush, Henry J., 3,641,440.
Eaton, Bruce, 3,640,174.
Eklund, Phillip R., 3,640,591.
Fisher, Mahlon B., 3,641,352.
Gordon, Hayden S., 3,641,446.
Jauvtis, Harvey L., 3,641,523.
Mifflin, Ralph W.; Wheeler, Joseph P.; and Massoud, Joseph T., 3,641,433.
Rosenthal, Sidney, 3,640,169.
Staehlin, John H.; and Peon, Gilbert A., 3,640,168.
Stockham, John D.; Townsend, Lawrence B.; Ohlhaber, Ronald L.; and Scopelite, Thomas M., 3,641,320.
Sues, Lawrence B., 3,641,515.
Army: *See—*
Messina, Joseph F.; and Gisser, Henry, 3,640,859.
Atomic Energy Commission: *See—*
Baybarz, Russell D.; and Peterson, Joseph R., 3,640,888.
Case, Forrest N.; Garrison, Arthur W.; Kau, Donald L.; and Smiley, David E., 3,640,808.
Dixon, Rod P., 3,640,336.
Duncan, Richard D.; and Salzano, George H., 3,640,115.
Knight, James T.; and Lee, Parley L., 3,640,805.
Krawetz, Barton, 3,641,454.
Partridge, Jerry A.; and Jensen, Reilly C., 3,641,226.
Price, Vernon G.; and Grow, Richard W., 3,641,465.
Ripley, Charles C., 3,640,845.
Robertshaw, Fred C.; Bartos, Jon .; Hurst, James J.; and McGurty, James August, 3,640,704.
Schurman, Walter R., 3,639,978.
Shank, Richard C.; Zucker, Carl E.; Jones, David H.; Ribbq Harry F.q Jr.; and Bayard, Robert T., 3,640,844.
Watts, Geoffrey P., 3,641,444.
Interior: *See—*
Johnson, Glenn E., 3,640,846.
Scheiner, Bernard J.; Lindstrom, Ronald E.; and Henrie, Thomas A., 3,639,925.
Sweeny, Keith H.; and Fischer, James R., 3,640,821.
National Aeronautics and Space Administration, Administrator, with respect to an invention of:
Mangion, Charles. System for pre-conditioning a combustible vapor. 3,640,256, Cl. 123-122.
Navy: *See—*
Beck, Cyrus, 3,641,268.
Belohoubek, Erwin F., 3,641,388.
Chatham, James R.; and Licata, William H., 3,640,178.
Herndon, John W., 3,641,260.
Kaufman, Martin H.; O'Drobinak, John D.; and Dake, James O., Jr., 3,640,070.
Mandel, Louis, 3,641,428.
Murphree, Francis J.; and Marrero, Michael T., 3,641,485.
O'Drobinak, John D.; and Kaufman, Martin H., 3,640,785.
Petrick, John T.; and Gray, Reginald I., 3,640,224.
Petropoulas, Spyros K.; Jehle, Robert E.; and Halberstam, Mendel M., 3,641,350.
Pittman, Ed P.; and Stanford, Roy A., 3,641,427.
Porter, Harry B.; and Weinhardt, Robert A., 3,640,484.
United States Steel Corporation: *See—*
Lankard, David R.; and Sheets, Herbert D., Jr., 3,640,737.
Stanley, Edward B., 3,640,780.
Universal Oil Products Company: *See—*
Geiser, Edward M., 3,640,629.
Hilfman, Lee, 3,640,903.
Klein, Lawrence C.; and Stevens, Laurence G., 3,640,684.
O'Hara, Mark J., 3,640,817.
Schmerling, Louis, 3,641,159.
Schmerling, Louis; and Dombro, Robert A., 3,641,165.
Watkins, Charles H., 3,640,819.
Wellnitz, Gregory L., 3,640,286.
University of Illinois Foundation: *See—*
Bitzer, Donald L.; Bandy, Lyle E.; Johnson, Roger L.; and Skaperdas, Dominic O., 3,641,529.
Unterstenhofer, Gunter: *See—*
Buchel, Karl-Heinz; Draber, Wilfried; Hammann, Ingeborg; and Unterstenhofer, Gunter,3,641,098.
Upjohn Company, The: *See—*
Argoudelis, Alexander D.; and Coats, John H., 3,641,244.
Upstone, Harlan R.: *See—*
Lutz, Leland H.; Heileman, Richard C.; Upstone, Harlan R.; Leonard, John M.; and Ottow, Melvin A.,3,639,950.
Uraneck, Carl A.: *See—*
Burleigh, John E., and Uraneck, Carl A.,3,640,986.
Urethane Fabricators, Inc.: *See—*
Fleck, Paul H., 3,641,228.
Urquhart, Thomas N.: *See—*
Koltuniak, Michael A.; and Urquhart, Thomas N.,3,641,419.
U.S. Electronic Services Corporation: *See—*
Bunting, Henry E.; and Smith, Paul E., 3,641,254.

U.S. Philips Corporation: *See*—
Albers, Wouter; and Verberkt, Jacobus, 3,641,406.
Cregeen, Derek, 3,641,382.
Lorenz, Rainer, 3,640,749.
Van der Kerk, Gerrit Johann Meine; and Tempel, Albert, 3,641,078.
Van Dijk, Hendrikus Josephus Antonius, 3,640,807.
Zuurveen, Frans, 3,639,979.

Usamoto, Teruyoshi; and Okita, Taisuke, to Sumitomo Chemical Company Limited. Co-curable composition using peroxides and maleimides as crosslinking agents. 3,641,215, Cl. 260-897.

Utton, Norman, to Automotive Products Company Limited. Clutch bearing with magnetic support. 3,640,364, Cl. 192-98.

Uzu, Keizo; Nakano, Kinichi; and Takahashi, Toshinaka, to Kyowa Hakko Kogyo Kabushiki Kaisha. O-acyl decarbamoyl mitomycins. 3,641,053, Cl. 260-326.3

Vacuum Concrete Corporation of America: *See*—
Creskoff, Jacob J., 3,640,562.

Van Arsdale, Lyle R.: *See*—
Grove, Marvin H.; Kim, Kee W.; and Van Arsdale, Lyle R.,3,641,542.

Vandenberg, Edwin J., to Hercules Incorporated. Polymerization of epoxides with dihydrocarbon zinc pre-reacted with water. 3,640,908, Cl. 260-2.

Van der Grinten, Willem J.; and Jernakoff, George, to General Electric Company. Multichannel readout mass spectrometer. 3,641,340, Cl. 250-41.9

Van der Kerk, Gerrit Johann Meine; and Tempel, Albert, to U.S. Philips Corporation. Method for preparing bis(alkyldiphenyl tin) sulfide. 3,641,078, Cl. 260-429.7

Van Dijk, Hendrikus Josephus Antonius, to U.S. Philips Corporation. Method of manufacturing a semiconductor device and semiconductor device manufactured by said method. 3,640,807, Cl. 204-143.

Van Driessche, Oscar Julien: *See*—
Volbach, Heinz; and Van Driessche, Oscar Julien,3,640,507.

van Drunen, Korstiaan J. M.: *See*—
Fontijn, Wilhelmus J.; and van Drunen, Korstiaan J. M.,3,641,232.

Van Elven, Aris: *See*—
Overmars, Henricus Gerardus Josef; Van Elven, Aris; and Noltes, Jan Gerrit,3,641,178.

Van Heyningen, Earle M.: *See*—
Murphy, Charles F.; Webber, J. Alan; Kaiser, Gary V.; Van Heyningen, Earle M.; Wright, Ian G.; and Cooper, Robin D. G.,3,641,014.

Van Ligten, Raoul F., to American Optical Corporation. Simulation of an extended incoherent object source in holography so as to eliminate speckle noise. 3,640,599, Cl. 350-3.5

Vapor Corporation: *See*—
Maher, Frank A., 3,639,963.

Varadi, Peter F.; and Sebestyen, Laslo G. Magnetic transducer having a conductive metal powder gap spacer. 3,641,281, Cl. 179-100.2

Varian Associates: *See*—
Leidigh, William J., 3,641,389.
Noble, Lowell A., 3,640,597.

Vaughan & Bushnell Mfg. Co.: *See*—
Porter, Laurence W., 3,640,324.

Vaughn, Richard C. Neckwear construction. 3,639,916, Cl. 2-130.

VEB Carl Zeiss Jena: *See*—
Winter, Ernst, 3,640,471.

Veeder Industries Inc.: *See*—
Prosprich, Frank B., 3,641,536.

Veening, Albert Hendrik: *See*—
Beersma, Pieter Johannes Adrianus; and Veening, Albert Hendrik,3,640,756.

Velsicol Chemical Corporation: *See*—
Richter, Sidney B.; and Krenzer, John, 3,641,143.
Richter, Sidney B.; and Kaplan, Ephraim H., 3,641,220.

Veltri, Richard D.: *See*—
Galasso, Francis S.; and Veltri, Richard D.,3,640,693.

Vepa AG: *See*—
Fleissner, Heinz; and Fleissner, Gerold, 3,639,955.

Verberkt, Jacobus: *See*—
Albers, Wouter; and Verberkt, Jacobus,3,641,406.

Verbridge, Ralph Gary, 25% to Schovee & Boston. Dual wheel for trucks. 3,640,583, Cl. 301-9.

Vereinigte Osterreichische Eisen-und Stahluwerke Aktiengesellschaft: *See*—
Spannlang, Ronald, 3,640,503.

Verga, John, to Hazeltine Research, Inc. Resonant fixture vibration amplifier. 3,640,124, Cl. 73-71.6

Vergara, William C.: *See*—
Green, Norman; Greenhouse, Harold M.; Vergara, William C.; and McGill, Robert L., Jr.,3,641,372.

Verheul, Cornelis, to Schwing, Friedrich W. Slide valve for high-viscosity pumps. 3,640,303, Cl. 137-238.

Verolme Vacuumtechnik Aktiengesellschaft: *See*—
Kurz, Otmar J. G., 3,640,832.

Vertin, Thomas D. Method and means for making master models. 3,640,182, Cl. 90-13.8

Vick, Stephen L., to Black and Decker Manufacturing Company, The. Brush lead retainer. 3,641,379, Cl. 310-239.

Victa Limited: *See*—
Glover, Peter David; Forshaw, Richard; and Steele, William Henry, 3,640,253.

Victor Company of Japan, Limited: *See*—
Kinjo, Hisao; Iwabuchi, Yoshitaka; Takashima, Seiichi; Kato, Takotoshi; and Okano, Keigo, 3,641,278.

Villa, Alfonso: *See*—
MacLean, Charles C., III; and Villa, Alfonso,3,640,040.

Vinokur, David. Vehicle anti-theft device utilizing cigarette lighter as timer. 3,641,492, Cl. 340-65.

Virsberg, Lars-Goran, to Allmanna Svenska Elektriska Aktiebolaget. Means for recording transient voltages. 3,641,587, Cl. 346-74.

Viste, Kenneth L.: *See*—
Horrom, Bruce W.; Crovetti, Aldo J.; and Viste, Kenneth L.,3,640,699.

Vockenhuber, Karl: *See*—
Keznickl, Eduard, 3,640,441.

Voelz, Frederick L., to Atlantic Richfield Company. Carburetor adjusting method. 3,640,255, Cl. 123-119.

Vogelsberg, Walter H., to Black and Decker Manufacturing Company, The. Touch control for electrical apparatus. 3,641,410, Cl. 318-345.

Vogt, Clarence L., to Bobrick Aero-Missile Products. Pressure relief valve. 3,640,306, Cl. 137-512.1

Vogt, Herbert; and Pause, Helmut. Apparatus for non-destructive materials testing of continuously advanced work pieces. 3,640,123, Cl. 73-71.5

Volbach, Heinz; and Van Driessche, Oscar Julien, to Arbed S. A. Barbed wire of increased tear resistance. 3,640,507, Cl. 256-6.

Volger, Hendrik C.: *See*—
Nakamaye, Kay L.; Slaugh, Lynn H.; Spooncer, William W.; and Volger, Hendrik C.,3,641,170.

Volkmann, Werner Karl: *See*—
Graf, Carlton Eugene; Skogsholm, Einar Aasen; and Volkmann, Werner Karl,3,641,421.

Von Duprin, Inc.: *See*—
Zawadzki, George Z.; and Godec, Maksimiljan, 3,640,560.

Von Eickstedt, Klaus-Wolf: *See*—
Milkowski, Wolfgang; Stuhmer, Werner; and Von Eickstedt, Klaus-Wolf,3,641,125.

Von Hippel, Eric A., to Graphic Sciences, Inc. Paper feed mechanism. 3,640,482, Cl. 242-67.1

Von Hippel, Hans-Joachim. Longwall mining apparatus. 3,640,574, Cl. 299-32.

Von Hollen, John. Hand drill and drill press. 3,640,635, Cl. 408-101.

Von Konig, Anita; Moll, Farnz; Muller-Bardorff, Wolfgang; and Saleck, Wilhelm, to Agfa-Gevaert Aktiengesellschaft. Silver halide emulsions containing bis-heter- cyclic n-containing compounds as antifoggants. 3,640,719, Cl. 96-109.

Voronoff, George N., to Textron Inc. Frequency independent IcR antenna. 3,641,579, Cl. 343-792.5

Vossen, John Louis, Jr. RCA Corporation Method of metalizing semiconductor devices. 3,640,811, Cl. 204-192.

Vossen, John Louis, Jr.; and Banfield, Joseph Henry, to RCA Corporation. Method of making electrical contacts on the surface of a semiconductor device. 3,640,812, Cl. 204-192.

Waage, Bard Meyer, to Habia Kommanditbolag. Method of applying a lubricating and friction- reducing layer on the inner surface of a tubular body of metallic material. 3,639,960, Cl. 29-149.5

Waddan, Dhafir Yusuf: *See*—
Cornforth, David Arthur; Waddan, Dhafir Yusuf; and Williams, Derek,3,641,106.

Wagner, Milton H. Mobile irrigation prinkler process and apparatuses therefor. 3,640,462, Cl. 239-11.

Wahl, James A.; and Nieminski, Robert A., to Eaton Yale & Towne Inc. Industrial vehicle. 3,640,415, Cl. 214-672.

Waki, Isamu, to Hartz Mountain Pet Foods, Inc. Detachable support device for pegboards. 3,640,497, Cl. 248-225.

Waldbillig, James O.: *See*—
Wiley, Morris A.; Lacoute, Roger G.; Henry, Clemence J.; and Waldbillig, James O.,3,640,872.

Walford, Gordon L.: *See*—
Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L.,3,641,134.

Walker, Clarence L., to Sherwood Medical Industries Inc. Variable capacity fluid dispensing device. 3,640,434, Cl. 222-144.5

Walker, Darrell W., to Phillips Petroleum Company. Oxidative conversion catalyst. 3,640,901, Cl. 252-437.

Walker, Edward R.: *See*—
O'Brien, Donald G.; and Walker, Edward R.,3,641,479.

Walker, Harold L., to Applications Unlimited, Inc. Pressurized continuous flow liquid applicator with shut-off valve. 3,640,630, Cl. 401-188.

Walker, Richard A.: *See*—
Field, Lester M.; Walker, Richard A.; and McKee, William E.,3,640,712.

Wall, Lamar J., to Poly-Optics, Inc. Decorative structure for flared fibres. 3,641,335, Cl. 240-10.

Wallace, Robert P., to Mite Corporation. Apparatus for utilizing hot and cool gas for thrust embedding a metal insert in a body of heat softenable material. 3,640,655, Cl. 18-1.

Wallingford, Clarence Robert, to Hazeltine Research, Inc. Semiconductor signal generating circuits. 3,641,369, Cl. 307-260.

Walsh, William L.: *See*—
Hay, Russell G.; McNulty, John G.; and Walsh, William L.,3,641,086.

Walther, Eric G., to Environment/One Corporation. CO measuring method and device. 3,640,688, Cl. 23-232.

Walton, Charles L. Protective shield for lathe. 3,640,321, Cl. 142-55.
Walton, George W. Valve seal ring including metal retainer rings. 3,640,501, Cl. 251-332.
Walz, Klaus; Hees, Walter; and Quaedvlieg, Mathieu, to Farbenfabriken Bayer Aktiengesellschaft. Process for dyeing fibre materials of polyacrylonitrile of acrylonitrile-containing copolymers. 3,640,677, Cl. 8-172.
Waner, Donald W.; Litzell, John E.; and Olsen, Roger F., to North American Rockwell Corporation. Control system for coordinated actuation of a transmission and throttle. 3,640,155, Cl. 74-875.
Wang Laboratories: *See*—
Chu, Ge Yao, 3,639,965.
Wanger, Robert P., to General Electric Company. Vertical orientation device. 3,640,487, Cl. 244-15.
Wankel G.m.b.H.: *See*—
Stephan, Gerhard; Harst, Heinz; Laux, Gunter; and Kappes, Alfred, 3,640,799.
Wantling, Joseph W., to Wedge Wire Corporation. Screening apparatus and method. 3,640,383, Cl. 209-17.
Ward, Geoffrey R.: *See*—
Briskin, Theodore; and Ward, Geoffrey R.,3,640,285.
Waren, Frank Arthur Oakley: *See*—
Mason, Frederick Percival; and Waren, Frank Arthur Oakley,3,640,247.
Warner & Swasey Company, The: *See*—
Schuman, Ralph H., 3,640,632.
Warner, Paul F.; and Huxley, Edward E., to Phillips Petroleum Company. Tarnish preventive composition comprising hydroxy containing thiol sulfides. 3,640,736, Cl. 106-3.
Warner-Lambert Company: *See*—
Zinnes, Harold; Shavel, John, Jr.; and Lindo, Neil A., 3,641,032.
Warner-Lambert Pharmaceutical Company: *See*—
Shavel, John, Jr.; and Farber, Sheldon, 3,641,152.
Warren Petroleum Corporation: *See*—
Phelps, Rex V., 3,640,237.
Waschk, Fritz; Muller, Jurgen; Krieger, Heinrich; and Heindrich, Gunter, to Apparatus for wet treatment of photographic film. or the like. 3,640,205, Cl.
Washecheck, Paul H.: *See*—
Portwood, Owen, Jr.; Starks, Charles M.; and Washecheck, Paul H.,3,641,163.
Wasney, Albert Jr.: *See*—
Chaplin, Richard W.; Holscher, Donald J.; Wasney, Albert Jr.; and Wheeler, Bryce A.,3,641,261.
Watanabe, Ichiro: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Matsui, Katsuaki; Kuramada, Tomoyuki; Watanabe, Ichiro; and Ohta, Noriyuki,3,640,928.
Watanabe, Kinnosuke: *See*—
Tomiyasu, Hiroshi; Inagaki, Tsuguya; Kajiura, Hiroshi; and Watanabe, Kinnosuke,3,640,135.
Watanabe, Yoshio; and Sakai, Tetsushi, to Nippon Telegraph and Telephone Public Corporation. Semiconductor device and method of producing the same. 3,640,806, Cl. 204-143.
Waterman, Herrick,: *See*—
Fuller, Ralph A.; and Snodgrass, Earl D., 3,640,190.
Watkins, Charles H., to Universal Oil Products Company. Inhibiting LPG production in a hydrocracking process. 3,640,819, Cl. 208-111.
Watson, Donald W., to Xerox Corporation. Combination controller-label form for article labeling systems. 3,641,313, Cl. 235-61.6
Watson, Frank George; and Sugden, David Burnet, to Robbins, James S., and Associates, Inc. Shield tunneling method. 3,640,077, Cl. 61-42.
Watters, Larry H., to Goodyear Tire & Rubber Company, The. Method of retarding fouling of a substrate surface. 3,640,769, Cl. 134-42.
Watts, Geoffrey P., to United States of America, Atomic Energy Commission. Baseline compensating integrator. 3,641,444, Cl. 328-127.
Watts, Raymond W. Prefabricated panel of shingles. 3,640,044, Cl. 52-543.
Waugh, Clayton Thomas: *See*—
Rowley, Edward Kenneth; and Waugh, Clayton Thomas,3,640,790.
Weagant, William D., to Sigman Industries, Inc. Cable splice cover. 3,641,253, Cl. 174-93.
Weaver, Max A.; Pridgen, Herman S.; and Coates, Clarence A., Jr., to Eastman Kodak Company. Mono azo compounds containing an aroyl-amino-n- alkoxycarboriyl benzylaniline coupling component. 3,640,995, Cl. 260-207.1
Webb, Austin A. Rail car and supporting track and switch system. 3,640,227, Cl. 104-130.
Webb, Bryant F.; and Schwalm, Bruce D., to Sperry Rand Corporation. Flail type rotor for a material spreader. 3,640,473, Cl. 239-658.
Webb, John M.: *See*—
Loxley, Ted A.; Webb, John M.; and Barber, Walter G.,3,640,398.
Webber, J Alan: *See*—
Murphy, Charles F.; Webber, J Alan; Kaiser, Gary V.; Van Heyningen, Earle M.; Wright, Ian G.; and Cooper, Robin D. G.,3,641,014.
Weber, A. John: *See*—
Wieland, Roman G.; Weber, A. John; Bearfield, Clair A.; and Cole, Raymond,3,640,520.
Weber, Heinz, to Telesco Brophey Limited. Automatically-opened, longitudinally-collapsible umbrella with improved handle. 3,640,298, Cl. 135-25.
Wedge Wire Corporation: *See*—
Wantling, Joseph W., 3,640,383.
Weil, Edward D.: *See*—
Biranowski, Jerome B.; and Weil, Edward D.,3,641,202.
Weinberger, Hershel, to State of Israel. Braille typewriter. 3,640,368, Cl. 197-6.1
Weingarden, Marshall L. Cassette album. 3,640,379, Cl. 206-1.
Weinhardt, Robert A.: *See*—
Porter, Harry B.; and Weinhardt, Robert A.,3,640,484.
Weinz, Ernst A. Open-loop stepping motor control circuit for a machine tool. 3,641,415, Cl. 318-696.
Weir, Donald Robert: *See*—
Zubryckyj, Nicolas; Mackiw, Vladimir Nicolaus; and Weir, Donald Robert,3,640,706.
Weisfeld, Lewis B., to Cincinnati Milacron Chemicals Inc. Halogenated resins stabilized with novel compositions. 3,640,950, Cl. 260-45.75
Weiss, Clifford P.: *See*—
Kivlen, John A.; Struth, Bert W.; and Weiss, Clifford P.,3,641,190.
Weiss, Margaret Rozman, to Miles Laboratories, Inc. Immunological reagent and process for making same. 3,641,235, Cl. 424-8.
Weiss, Shirley I., deceased0 (by Albert, Joel M., executor). Annular cutting blades. 3,640,027, Cl. 51-206.
Weisshuhn, Peter: *See*—
Oelmann, Peter; and Weisshuhn, Peter,3,640,522.
Weist, Edward Landis: *See*—
Demler, Henry William, Sr.; and Weist, Edward Landis,3,640,552.
Weitzel, Hans; Dinges, Karl; Gobel, Wilhelm; and Hardt, Dietrich, to Farbenfabriken Bayer Aktiengesellschaft. Thermoplast moulding compositions. 3,641,206, Cl. 260-876.
Welcker, Clyde J.; and Welcker, Roland, to Welcker Corporation, The. Shrimp processing apparatus. 3,639,946, Cl. 17-71.
Welcker Corporation, The: *See*—
Welcker, Clyde J.; and Welcker, Roland, 3,639,946.
Welcker, Roland: *See*—
Welcker, Clyde J.; and Welcker, Roland,3,639,946.
Weldotron Corporation: *See*—
Zelnick, Seymour; and Wildmoser, Martin Michael, 3,640,048.
Wellnitz, Gregory L., to Universal Oil Products Company. Ashtray with use indicator. 3,640,286, Cl. 131-235.
Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Hottinger, Conrad C., 3,640,177.
Sigrist, Hugo, 3,640,179.
Werneth, Charles J.: *See*—
Di Vita, Philip S.; Powers, Earl N.; and Werneth, Charles J.,3,641,509.
Wessel Hardware Corporation: *See*—
Lorincz, Eugene M., 3,640,106.
Westerkamp, Hugo; and Dubois, Robert, to Huber & Co. Magnetic phonograph pickup having plural inducing magnets. 3,641,284, Cl. 179-100.41
Westerlund, Gothe O., to Chemech Engineering Ltd. Method for conducting electrolyte to, from and through an electrolytic cell. 3,640,804, Cl. 204-95.
Western Electric Company, Incorporated: *See*—
Ludwig, David P., 3,640,444.
Thelen, Charles O.; and Ziegler, Hans J., 3,640,493.
Western Kraft Corporation: *See*—
Bastian, Donald Lee, 3,640,449.
Westinghouse Electric Corporation: *See*—
Cricchi, James R.; and Lancaster, Edgar D., Jr., 3,641,511.
Gyugyi, Laszlo, 3,641,417.
Hoffman, Emil De Coudres, 3,641,537.
McNally, Francis X.; and Chiou, Louis, 3,641,353.
Zerby, John C., 3,641,443.
Weston Chemical Corporation: *See*—
Friedman, Lester; Rattenbury, Kenneth H.; and Guttag, Alvin, 3,641,218.
Westvaco Corporation: *See*—
Forbes, Hampton E., Jr.; and La Freniere, Lawrence J., 3,640,447.
Touzinsky, Gerald F.; and Maurer, Hans W., 3,640,92 5.
Wheeler, Bryce A.: *See*—
Chaplin, Richard W.; Holscher, Donald J.; Wasney, Albert Jr.; and Wheeler, Bryce A.,3,641,261.
Wheeler, Joseph P.: *See*—
Mifflin, Ralph W.; Wheeler, Joseph P.; and Massoud, Joseph T.,3,641,433.
Whirlpool Corporation: *See*—
Harrison, Bobby G.; and Esche, Charles D., 3,640,087.
Mason, Anthony, 3,639,998.
White, Bobby J.: *See*—
Smith, Clifford E.; and White, Bobby J.,3,641,184.
White, Donald J.; and Navin, William R., Jr., to General Instrument Corporation. Contour mapping system. 3,641,484, Cl. 340-3.
White, Letcher T. Dust eliminating coal mining apparatus. 3,640,580, Cl. 299-31.
White, Richard E. Shower curtain holder. 3,639,919, Cl. 4-149.
White, Warren V.: *See*—
Ross, John M.; White, Warren V.; and Wortman, Robert R.,3,640,366.
Whitehead, Cecil Thomas; and Critchley, Anthony Francis Ewart, to International Computers Limited. Data recording apparatus. 3,641,502, Cl. 340-172.5

Whitehurst, Gerald E.: *See—*
Clark, Richard B.; Morris, Hugh C.; and Whitehurst, Gerald E.,3,640,359.
Whitfill, William A., Jr., to Schlumberger Technology Corporation. Spiral tubing cutter. 3,640,181, Cl. 90-11.4
Whiting, John S.: *See—*
Cupp, Frederick B.; and Whiting, John S.,3,641,506.
Whitney, John A.; and Woods, Richard E., to Eckrich, Peter, & Sons, Inc. Telemetering transmitter. 3,641,538, Cl. 345-208.
Whittaker Corporation: *See—*
Findley, Harold J.; and Meier, James L., 3,640,941.
Wicke, Charles H.: *See—*
Gulick, Ronald A.; and Wicke, Charles H.,3,640,140.
Widder, Rudi: *See—*
Distler, Harry; and Widder, Rudi,3,641,072.
Wiechert, Rudolf: *See—*
Engelfried, Otto; Neumann, Friedmund; and Wiechert, Rudolf,3,641,013.
Wieland, Roman G.; Weber, A. John; Bearfield, Clair A.; and Cole, Raymond, to Tri W-G Inc. Therapy treatment tilt table. 3,640,520, Cl. 269-323.
Wilcox, Harold R., to Riggs & Lombard, Inc. Continuous open width washer. 3,640,101, Cl. 68-175.
Wild, Anthony Musgrave: *See—*
Hayman, David Frank; and Wild, Anthony Musgrave,3,641,123.
Wilder, Joseph R.: *See—*
Reick, Franklin G.; and Wilder, Joseph R., 3,641,332.
Wilder, Joseph R.: *See—*
Reick, Franklin G.; and Wilder, Joseph R.,3,641,332.
Wildmoser, Martin Michael: *See—*
Zelnick, Seymour; and Wildmoser, Martin Michael,3,640,048.
Wiley, Morris A.; Lacoste, Roger G.; Henry, Clemence J.; and Waldbillig, James O., to Texaco Inc. Automatic trasmission fluid. 3,640,872, Cl. 252-75.
Wilke, Gunther; and Muller, Ernst Willi. Process for the production of dimers and trimers of conjugated dienes. 3,641,175, Cl. 260-666.
Wilkinson, Carolyn J.: *See—*
Kamen, Jack M.; and Wilkinson, Carolyn J.,3,640,282.
Williams, Derek: *See—*
Cornforth, David Arthur; Waddan, Dhafir Yusuf; and Williams, Derek,3,641,106.
Williams Instruments, Inc.: *See—*
Williams, Robert A., 3,641,430.
Williams, Laurence Lyman, to American Cyanamid Company. Wet strength resins. 3,640,936, Cl. 260-29.6
Williams, Ralph P., to Phillips Petroleum Company. 3-Hydrocarbyloxynitrile synthesis. 3,641,099, Cl. 260-465.6
Williams, Robert A., to Williams Instruments, Inc. Electrical contact test apparatus for cap of a military aircraft ejection rack. 3,641,430, Cl. 324-51.
Williams, Robert J., to Dover Molded Products Company. Throw-away closure for test tube. 3,640,418, Cl. 215-41.
Williams, Roy M., Jr.: *See—*
Longland, John R.; Williams, Roy M., Jr.; Sutton, Howard D.; and Scopelite, Thomas M.,3,641,324.
Williamson, J. E. (Johnnie): *See—*
Arnold, Lucius P., by Arnold, L. P., and Arnold, Evelyn S.; heirs, 3,640,025.
Willinger, Allan H., to Metaframe Corporation. Siphoning device. 3,640,302, Cl. 137-142.
Willinger, Allan H., to Metaframe Corporation. Aerating device. 3,640,516, Cl. 261-121.
Wilson, Calvin L., to Reynolds Metals Company. Disposable broiling pan. 3,640,209, Cl. 99-446.
Wilson, Phillip M. Electrode holder for arc welding. 3,641,310, Cl. 219-127.
Wilson, Robert C., Jr., to Mobil Oil Corporation. Clinoptilolite blends with shape-selective catalyst. 3,640,905, Cl. 252-455.
Windmoller & Holscher: *See—*
Mundus, Friedhelm, 3,640,187.
Rochla, Kurt, 3,640,794.
Winfree, Jules P.; Todd, Herbert E.; and McComas, Charles C., to United Aircraft Corporation. Coating of titanium alloys. 3,640,778, Cl. 148-6.
Wingood, Ivan L.: *See—*
Klein, Gerhart P.; and Wingood, Ivan L.,3,641,399.
Winslow, Alfred Edwards; and Spicer, John Calvin, to Borden Company, The. Method for controlling adhesion of paper on yankee drier with polyamides and resultant products. 3,640,841, Cl. 162-164.
Winter, Ernst, to VEB Carl Zeiss Jena. Annular atomizer for flame photometry. 3,640,471, Cl. 239-337.
Wise, Albert W.: *See—*
Gates, John W., Jr.; Wise, Albert W.; Beavers, Dorothy J.; and Miller, Paul E.,3,641,046.
Wisleder, Robert W.: *See—*
Cushman, Glenn F.; Prasad, Brijeshwari,; and Wisleder, Robert W.,3,641,563.
Witco Chemical Corporation: *See—*
Chisholm, Daniel R.; Solomon, Jack M.; and Isbitsky, Bernard, 3,641,022.
Witzel, Bruce E.: *See—*
Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L.,3,641,134.
Wojcik, Gerald E., to Owens-Illinois, Inc. Electroconductive sintered glass. 3,640,906, Cl. 252-519.
Wolf, Carol: *See—*
Moisescu, Gheorghe; Stoica, Valer; Wolf, Carol; and Spataru, Nicolae,3,640,206.
Wolf, Eberhard: *See—*
Maier, Martin; and Wolf, Eberhard,3,640,056.
Wolf, Jesse David, to Trans-Horizons, Inc. Photographic scan camera using a pivoted mirror. 3,640,199, Cl. 95-15.
Wolfe, Raymond: *See—*
Robbins, Murray; and Wolfe, Raymond,3,640,864.
Wolfe, Robert N., to Eastman Kodak Company. Projection screen. 3,640,602, Cl. 350-120.
Wolverine World Wide, Inc.: *See—*
Harlan, Martin L.; Davis, Jerry L.; and Nyland, Lloyd A., 3,640,325.
Wolverine-Pentronix, Inc.: *See—*
Smith, Joseph E., 3,640,654.
Wolverton, Harry D.: *See—*
Cunning, Alfred C.; and Wolverton, Harry D.,3,640,128.
Womble, George E., to Kewanee Machinery & Conveyor Company. S-shaped standard. 3,640,348, Cl. 172-573.
Wood, Prentice J., to Mead Corporation, The. Bottle carrier. 3,640,448, Cl. 229-40.
Wood, Prentice J., to Mead Corporation, The. Carrier for flanged article. 3,640,563, Cl. 294-87.2
Woods, Richard E.: *See—*
Whitney, John A.; and Woods, Richard E.,3,641,538.
Woodward Governor Company: *See—*
Schelin, Carl O.; and Eisentraut, Arne L., 3,639,972.
Woodward, Jack Thomas Armon; and Jordan, Edward Graham, to Standard Telephone and Cables Limited. Magnetic recording head of multiple core printed circuit construction. 3,641,586, Cl. 346-74.
Worley, George W., to Troxel Manufacturing Company. Bicycle saddle brace. 3,640,548, Cl. 280-289.
Wortman, Robert R.: *See—*
Ross, John M.; White, Warren V.; and Wortman, Robert R.,3,640,366.
Wright, Arthur J.: *See—*
Lin, Chao-Han; and Wright, Arthur J.,3,641,011.
Wright, Ian G.: *See—*
Murphy, Charles F.; Webber, J. Alan; Kaiser, Gary V.; Van Heyningen, Earle M.; Wright, Ian G.; and Cooper, Robin D. G.,3,641,014.
Wright, William Blythe, Jr.; and Brabander, Herbert Joseph, to American Cyanamid Company. Substituted benzoxazolecarboxamides and benzothiazolecarboximides. 3,641,029, Cl. 260-268.
Wuttke, Gerhard: *See—*
Eberle, Hans; and Wuttke, Gerhard,3,640,921.
Wyandotte Chemicals Corporation: *See—*
Hymes, Alan C.; Margulis, Rajko R.; and Nalbandian, Robert M., 3,641,240.
Kokorudz, Michael, 3,641,151.
Wydler, Robert, to Maag Gear Wheel & Machine Company Limited. Gear tooth system for gear pumps. 3,640,650, Cl. 418-206.
Wyke, Edward R., to Litton Business Systems, Inc. Planographic printing plate. 3,640,221, Cl. 101-453.
Xerox Corporation: *See—*
Becker, Gunter E., 3,640,406.
Caldwell, John P., 3,640,707.
Cassano, James R.; Smith, Charles E.; and Kalvitis, Robert E., 3,640,614.
Egnaczak, Raymond K.; and Squassoni, Gino F., 3,640,616.
Haas, Werner E. L., 3,640,746.
Jeromin, Lothar S.; and Hoyt, Hazen L., III, 3,640,246.
Mammino, Joseph; and Ferguson, Robert M., 3,640,710.
McGuire, John V., 3,641,319.
Nielander, William B., 3,640,248.
Schaeffer, Robert A., 3,640,615.
Watson, Donald W., 3,641,313.
Young, Eugene F., 3,640,249.
Yagishita, Aisaburo. Heating and concentrating tower for plating waste recovery unit. 3,640,331, Cl. 159-23.
Yamada, Keisho; Nagai, Shigeki; Odan, Kyoji; Arima, Yasutaka; and Hidaka, Mikio, to Ube Industries, Ltd. Process for the manufacture of acrylonitrile by ammoxidation of propylene. 3,641,101, Cl. 260-465.3
Yamada, Keisho; Nagai, Shigeki; Odan, Kyoji; Nakamura, Yasuo; and Hidaka, Mijio, to Ube Industries, Ltd. Process for the manufacture of acrylonitrile. 3,641,100, Cl. 260-465.3
Yamaguchi, Nario: *See—*
Kundo, Kishichiro; Iwata, Hiroo; Yamaguchi, Nario; Shimizu, Sakae; and Tubuko, Kazuo,3,640,709.
Yamaguchi, Terumoto, to Nippon Denso Kabushiki Kaisha. Device for forming the stator cores for dynamo- electric machines and alternating-current machines. 3,640,165, Cl. 83-116.
Yamamoto, Hisao; Kitagawa, Sumio; Inaba, Shigeho; Sakai, Shigeru; Hirohashi, Toshiyuki, Maruyama, Isamu; Akatsu, Mitsuhiro; and Izumi, Takahiro, assors. to Sumitomo Chemical Company, Ltd. Benzodiazepine derivatives and salts thereof. 3,641,002, Cl. 260-239.3
Yamanaka, Yoshiyuki: *See—*
Ichikawa, Yataro; and Yamanaka, Yoshiyuki,3,641,112.

Yancik, Joseph J.; Schulze, Roy E.; and Rydlund, Paul H., to Monsanto Company. Blasting agents containing guar gum. 3,640,784, Cl. 149-43.
Yang, Kang: *See*—
Johnson, Morris A.; and Yang, Kang,3,641,172.
Yao, Ying L., to International Business Machines Corporation. Dynamic shift/store register. 3,641,360, Cl. 307-221.
Yarnell, John, to Hawker Siddely Dynamics Limited. Optical information processing method employing photochromically-generated holograms as spatial filters. 3,640,604, Cl. 350-162.
Yates, James F.: *See*—
Lundeen, Allan J.; and Yates, James F.,3,641,085.
Yates, Lester R.; Dorsey, Charles M., Jr.; Howell, John B.; Conklin, Winfred S.; Sawicki, Joseph J.; Shepherd, Reeves T.; and Soares, Silvio, to Bendix Corporation, The. Wide band crystal controlled transceiver with remote digital tuning. 3,641,434, Cl. 325-17.
Yoo, Jin Sun; and Koncos, Robert, to Atlantic Richfield Company. Process for polymerizing olefins. 3,641,188, Cl. 260-683.15
Yoshioka, Takao: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Matsui, Katsuaki; Kuramada, Tomoyuki; Watanabe, Ichiro; and Ohta, Noriyuki,3,640,928.
Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Nakanishi, Michio; Kobayashi, Ryosuke; Abe, Kozo; and Mukai, Toshihiko, 3,641,060.
Young, David W.: *See*—
Chambers, Robert R.; Isaacson, Henry V.; and Young, David W.,3,640,973.
Young, Elgin E.: *See*—
Darr, Donald E.; Edwards, G Byron; Loehr, Clifford E.; and Young, Elgin E.,3,640,745.
Young, Elwyn Richard: *See*—
Scanlon, Patricia M.; and Young, Elwyn Richard,3,641,103.
Young, Eugene F., to Xerox Corporation. Transfer apparatus. 3,640,249, Cl. 118-637.
Young, Feramorz H. Chair coupling device. 3,640,569, Cl. 297-248.
Young, James M. Method of making multiple tendon, prestressed segmented concrete beam. 3,639,973, Cl. 29-452.
Young, Stephen A. Connection for spout adjustment. 3,640,305, Cl. 137-360.
Yui, Nooyuki Henry: *See*—
Hullinger, Clifford H.; Cohen, Lawrence; and Yui, Nooyuki Henry,3,640,842.
Yushin Seiki Kogyo Kabushiki Kaisha: *See*—
Shimomura, Yoshisada, 3,641,489.
Zahoransky, Anton, Firma: *See*—
Zahoransky, Heinz, 3,640,582.
Zahoransky, Heinz, to Zahoransky, Anton, Firma. Brush-making machine. 3,640,582, Cl. 300-3.
Zawadzki, George Z.; and Godec, Maksimiljan, to Von Duprin, Inc. Electric latch strike. 3,640,560, Cl. 292-341.16
Zdaniewski, Joseph J.: *See*—
Bostick, Edgar E.; and Zdaniewski, Joseph J.,3,641,090.
Zeller, Paul: *See*—
Hegedus, Balthasar; and Zeller, Paul,3,641,097.
Zelnick, Seymour; and Wildmoser, Martin Michael, to Weldotron Corporation. Method and apparatus for a pallet load. 3,640,048, Cl. 53-30.
Zenith Radio Corporation: *See*—
Farbanish, Walter, 3,641,576.
Zerby, John C., to Westinghouse Electric Corporation. Frequency compensated pulse time discriminator. 3,641,443, Cl. 328-109.
Ziegelhoffer, Paul: *See*—
Nystrand, Ernst Daniel; Spencer, Harvey J.; and Ziegelhoffer, Paul,3,640,050.
Ziegler, Hans J.: *See*—
Thelen, Charles O.; and Ziegler, Hans J.,3,640,493.
Ziegler, William E.: *See*—
Rupert, Samuel J.; and Ziegler, William E.,3,640,667.
Ziemann, Heinz; Lehmann, Wolfgang; and Troemel, Gerhard, to Farbenfabriken Bayer Aktiengesellschaft. 3 Component reaction product and process for increasing the wet strength of paper. 3,640,840, Cl. 162-164.
Zildjian, Robert, to Avedis Zildjian Avedis Company. Method of buffing a metal percussion instrument. 3,640,029, Cl. 51-322.
Zimmerman, Burton R.; Bodley, Roger W.; and Goodman, Robert C., to Educational Research Council of America. Cardboard camera and kit therefor. 3,640,195, Cl. 95-11.
Zinnes, Harold; Shavel, John, Jr.; and Lindo, Neil A., to Warner-Lambert Company. N,N-Disubstituted 2-alkyl-3-hydroxy-1 (2H)-isoquinolonecarbamates. 3,641,032, Cl. 260-287.
Zito Company, Inc., The: *See*—
Zito, Ralph, Jr., 3,640,770.
Zito, Ralph, Jr., 3,640,771.
Zito, Ralph, Jr., to Zito Company, Inc., The, mesne. Rechargeable metal halide battery. 3,640,770, Cl. 136-6.
Zito, Ralph, Jr., to Zito Company, Inc., The, mesne. Metal bromide battery. 3,640,771, Cl. 136-6.
Zubryckyj, Nicolas; Mackiw, Vladimir Nicolaus; and Weir, Donald Robert. Method for recovering substantially pure nickel from ammoniacal nickel ammonium carbonate leach solutions. 3,640,706, Cl. 75-103.
Zucker, Carl E.: *See*—
Shank, Richard C.; Zucker, Carl E.; Jones, David H.; Ribbq Harry F.q Jr.; and Bayard, Robert T.,3,640,844.
Zust, Armin: *See*—
Schinkler, Walter; and Zust, Armin,3,641,031.
Zuurveen, Frans, to U.S. Philips Corporation, mesne. Dry-shaving apparatus. 3,639,979, Cl. 30-43.6

LIST OF DESIGN PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF FEBRUARY, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Brown, Hesper P. Mobile storage cabinet. 222,933, 2-8-72, Cl. D14—3.

Cole, Eric L., to Wilkinson Sword Ltd. Sword blade. 222,934, 2-8-72, Cl. D22—1.

Cole, Eric L., to Wilkinson Sword Ltd. Sword blade. 222,935, 2-8-72, Cl. D22—1.

Cole, Eric L., to Wilkinson Sword Ltd. Sword blade. 222,936, 2-8-72, Cl. D22—1.

Cole, Eric L., to Wilkinson Sword Ltd. Sword blade. 222,937, 2-8-72, Cl. D22—1.

Cole, Eric L., to Wilkinson Sword Ltd. Sword blade. 222,938, 2-8-72, Cl. D22—1.

Congoleum Industries, Inc.: *See*—
Tejeda, Oscar G., and Shortway. 222,958.

Dallaire, Raymond M. Extruded plastic meeting rail for window unit. 222,932, 2-8-72, Cl. D13—6.

DeSoto, Inc.: See—
Eaves, Randall H. 222,940.

Eaves, Randall H., to DeSoto, Inc. Fireplace grate. 222,940, 2-8-72, Cl. D23—98.

Gillette Co., The: *See*—
Nigro, Louis V. 222,931.

Goldfarb, Barbara L. Hat. 222,930, 2-8-72, Cl. D2—239.

Haas, Robert V., to The Singer Co. Oil container. 222,939, 2-8-72, Cl. D23—5.

Ivac Corp.: *See*—
Sato, Stephens N. 222,956.
Sato, Stephens N. 222,957.

Kaneko, Shiro. Spoon or similar article. 222,952, 2-8-72, Cl. D54—12.

Knox, William W., to Mag-Nif, Inc. Game piece box. 222,945, 2-8-72, Cl. D34—5.

Knox, William W., to Mag-Nif, Inc. Novelty amusement device. 222,946, 2-8-72, Cl. D34—15.

Knox, William W., to Mag-Nif, Inc. Transposition puzzle. 222,947, 2-8-72, Cl. D34—15.

Knox, William W., to Mag-Nif, Inc. Stacking puzzle. 222,948, 2-8-72, Cl. D34—15.

Knutson, Robert C., to Vexilar, Inc. Depth meter. 222,941, 2-8-72, Cl. D26—1.

Krumin, Donald K., and R. J. Toth, to Motorola, Inc. Television camera or similar article. 222,955, 2-8-72, Cl. D61—1.

Mag-Nif, Inc.: *See*—
Knox, William W. 222,945.
Knox, William W. 222,946.
Knox, William W. 222,947.
Knox, William W. 222,948.

Majewski, Eugene J. Storage rack for wine bottles or the like. 222,950, 2-8-72, Cl. D44—29.

Manderfield, Ellen B., to Oneida Ltd. Spoon. 222,953, 2-8-72, Cl. D54—12.

Motorola, Inc.: *See*—
Krumin, Donald K. and Toth. 222,955.

Nigro, Louis V., to The Gillette Co. Dispensing container for liquids or the like. 222,931, 2-8-72, Cl. D9—83.

Oneida Ltd.: *See*—
Manderfield, Ellen B. 222,953.

Pelensky, Walter J. Stringed musical instrument. 222,954, 2-8-72, Cl. D56—1.

Sato, Stephens N., to Ivac Corp. Fluid delivery apparatus. 222,956, 2-8-72, Cl. D83—1.

Sato, Stephens N., to Ivac Corp. Fluid delivery apparatus. 222,957, 2-8-72, Cl. D83—1.

Shlesinger, Bernard E., Jr. Reed switch envelope. 222,942, 2-8-72, Cl. D26—13.

Shlesinger, Bernard E., Jr. Reed switch envelope. 222,943, 2-8-72, Cl. D26—13.

Shlesinger, Bernard E., Jr. Reed switch envelope. 222,944, 2-8-72, Cl. D26—13.

Shortway, Harry A.: *See*—
Tejeda, Oscar G., and Shortway. 222,958.

Singer Co., The: *See*—
Haas, Robert V. 222,939.

Souder, Raymond G. Hanging planter. 222,949, 2-8-72, Cl. D35—3.

Stringer, Freeman. Combined litter and article stowage bucket for automobiles or the like. 222,951, 2-8-72, Cl. D49—34.

Tejeda, Oscar G., and H. A. Shortway, to Congoleum Industries, Inc. Solid surface floor covering or similar article. 222,958, 2-8-72, Cl. D92—4.

Toth, Richard J.: *See*—
Krumin, Donald K. and Toth. 222,955.

Vexilar, Inc.: *See*—
Knutson, Robert C. 222,941.

Wilkinson Sword Ltd.: *See*—
Cole, Eric L. 222,934.
Cole, Eric L. 222,935.
Cole, Eric L. 222,936.
Cole, Eric L. 222,937.
Cole, Eric L. 222,938.

LIST OF DESIGN PATENTEES

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 8, 1972

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

93 3,639,914
114 3,639,915
130 3,639,916
270 3,639,917

CLASS 4

67 3,639,918
149 3,639,919
166 3,639,920
172.11 3,639,921
237 3,639,922

CLASS 5

2 3,639,924
81 3,639,926
91 3,639,927
327 3,639,929
330 3,639,930
343 3,639,931

CLASS 8

41 3,640,674
115.6 3,640,675
127.6 3,640,676
172 3,640,677

CLASS 9

2F 3,639,933

CLASS 13

22 3,641,249
31 3,641,250

CLASS 14

71 3,639,934
72 3,639,935

CLASS 15

4 3,639,936
104.8 3,639,937
250.06 3,639,938
320 3,639,939
352 3,639,940
372 3,639,941

CLASS 16

29 3,639,942
82 3,639,943
153 3,639,944

CLASS 17

11 3,639,945
71 3,639,946

CLASS 18

1 3,640,655
8 3,640,670
16 3,640,860
35 3,640,868

CLASS 23

15R 3,640,679
22 3,640,678
111 3,640,680
3,640,681
137 3,640,682
145 3,640,683
147 3,640,684
153 3,640,685
181 3,640,686
209.1 3,639,953
230B 3,640,687
232R 3,640,688

CLASS 24

30.5R 3,639,947
49 3,639,949
205.17 3,639,948
230 3,639,950
3,639,951
255BC 3,639,952

CLASS 25

1 3,640,658

CLASS 28

1CL 3,639,954
1.6 3,639,955

CLASS 29

116 3,639,956
120 3,639,957
130 3,639,958
132 3,639,959
149.5NM 3,639,960
149.5B 3,639,961
155R 3,639,962
157.3R 3,639,963
159.01 3,639,964
195 3,640,689
196.1 3,640,690
203MM 3,639,965
203D 3,639,966
211 3,639,968
237 3,639,967
408 3,639,969
411 3,639,970
437 3,639,971
451 3,639,972
452 3,639,973
493 3,639,974
580 3,639,975
603 3,639,976
628 3,639,977
3,639,978

CLASS 30

34.1 3,639,984
43.6 3,639,979
102 3,639,980
114 3,639,981
279 3,639,982
294 3,639,983

CLASS 32

11 3,639,985
14A 3,639,986

CLASS 33

1SA 3,639,989
2 3,639,987
11 3,639,988
18R 3,639,990
19A 3,639,991
174PA 3,639,992
3,639,994
174 3,639,993
179 3,639,995
199 3,639,996
221 3,639,997

CLASS 34

82 3,639,998
92 3,639,999
125 3,640,000
218 3,640,001

CLASS 35

8R 3,640,002

CLASS 36

2.5AL 3,640,003
8.1 3,640,006
15 3,640,004

CLASS 37

42R 3,640,005

CLASS 38

41 3,640,007

CLASS 40

2R 3,640,008
2.2 3,640,009
124.1 3,640,010
133A 3,640,011

CLASS 42

1R 3,640,012
77 3,640,013

CLASS 43

42.43 3,640,014
83.5 3,640,015

CLASS 44

1 3,640,016
62 3,640,691
63 3,640,692

CLASS 45

19 3,640,052

CLASS 46

23 3,640,017
29 3,640,018
49 3,640,019

CLASS 47

1 3,640,020
9 3,640,021

CLASS 49

420 3,640,022

CLASS 51

8 3,640,023
165.87 3,640,024
206 3,640,027
215AR 3,640,025
215R 3,640,026
289S 3,640,028
322 3,640,029
325 3,640,030
391 3,640,031

CLASS 52

2 3,640,032
7D 3,640,034
36 3,640,033
126 3,640,036
169 3,640,037
177 3,640,035
224 3,640,038
281 3,640,039
337 3,640,040
390 3,640,041
475 3,640,042
508 3,640,043
543 3,640,044
747 3,640,045
749 3,640,046

CLASS 53

22A 3,640,047
30 3,640,048
3,640,049
120 3,640,050
178 3,640,051

CLASS 55

19 3,640,052
227 3,640,053
228 3,640,054

CLASS 56

106 3,640,055
370 3,640,056

CLASS 57

18 3,640,057
34TT 3,640,058
34R 3,640,059
58.84 3,640,060
58.89 3,640,061
88 3,640,062
140R 3,640,063
144 3,640,064

CLASS 58

90R 3,640,065

CLASS 60

52HF 3,640,068
53R 3,640,066
54.6P 3,640,067
105 3,640,069
220 3,640,070
221 3,640,071
258 3,640,072

CLASS 61

1F 3,640,073
1R 3,640,074
5 3,640,075
42 3,640,076
3,640,077
69A 3,640,078
89 3,640,079
72.3 3,640,080

CLASS 62

1 3,640,081
6 3,640,082
52 3,640,083
101 3,640,084
158 3,640,085
210 3,640,086
227 3,640,087
320 3,640,088
3,640,089
436 3,640,090
514 3,640,091

CLASS 64

28 3,640,092

CLASS 65

2 3,640,693
116 3,640,694
134 3,640,093

CLASS 66

19 3,640,094
147 3,640,095
176 3,640,096
3,640,097

CLASS 68

12R 3,640,098
19.1 3,640,099
150 3,640,100
175 3,640,101
176 3,640,102
177 3,640,103
210 3,640,104

CLASS 69

41 3,640,105

CLASS 70

93 3,640,106
129 3,640,107
456R 3,640,108

CLASS 71

1 3,640,695
9 3,640,696
27 3,640,697
29 3,640,698
118 3,640,699

CLASS 72

37 3,640,109
56 3,640,110
60 3,640,111
138 3,640,112
332 3,640,113
365 3,640,114
393 3,640,115
476 3,640,116

CLASS 73

1R 3,640,117
9 3,640,118
23 3,640,119
53 3,640,120
54 3,640,121
67.9 3,640,122
71.5 3,640,123
71.6 3,640,124
73 3,640,125
88R 3,640,126
95.5 3,640,127
118 3,640,128
119R 3,640,129
133 3,640,130
136A 3,640,131
146 3,640,132
194B 3,640,133
228 3,640,135
3,640,136
299 3,640,134

CLASS 74

5.34 3,640,137
89.15 3,640,138
3,640,139
3,640,140
3,640,141
112 3,640,142
230.05 3,640,143
242.15R 3,640,144
248 3,640,145
364 3,640,146
424.8R 3,640,147
434 3,640,148
574 3,640,149
674 3,640,150
731 3,640,151
752 3,640,152
759 3,640,153
800 3,640,154
866 3,640,156
869 3,640,157
875 3,640,155

CLASS 75

10C 3,640,700
40 3,640,701
59 3,640,702
101R 3,639,925
101 3,640,703
103 3,640,706
128W 3,640,704
172 3,640,705

CLASS 79

176 3,640,734

CLASS 81

58.3 3,640,158
165 3,640,159

CLASS 83

24 3,640,160
36 3,640,161
52 3,640,162
53 3,640,163
67 3,640,164
116 3,640,165
201 3,640,166
380 3,640,167
444 3,640,168
639 3,640,169
698 3,640,170

CLASS 84

216 3,640,171

CLASS 85

8.8 3,640,172
3,640,173
9 3,640,174
45 3,640,175

CLASS 87

33 3,640,176

CLASS 89

1.81 3,640,179
33F 3,640,177
41CE 3,640,178

CLASS 90

11R 3,640,180
11.4 3,640,181
13.8 3,640,182

CLASS 91

1 3,640,183
387 3,640,184
411R 3,640,185

CLASS 92

169 3,640,186

CLASS 93

8R 3,640,187
36.01 3,640,188
49R 3,640,189
94PS 3,640,190

CLASS 94

13 3,640,191
50R 3,640,192

CLASS 95

4.5R 3,640,193
11L 3,640,194
11R 3,640,195
3,640,724
11.5R 3,640,196
12 3,640,197
13 3,640,198
15 3,640,199
19 3,640,200
31EL 3,640,201
42 3,640,202
89R 3,640,203
94R 3,640,204
95 3,640,205

CLASS 96

1.4 3,640,707
1.5 3,640,708
3,640,709
3,640,710
27H 3,640,711
27 3,640,712
29 3,640,713
49 3,640,714
55 3,640,715
56 3,640,716
59 3,640,717
89 3,640,718
109 3,640,719
111 3,640,720
114.4 3,640,721
115P 3,640,722

CLASS 99

9 3,640,723
17 3,640,725
68 3,640,726
77.1 3,640,727
80R 3,640,728
83 3,640,729
91 3,640,730
113 3,640,731
114 3,640,732
148 3,640,733
176 3,640,735
237 3,640,206
327 3,640,207
408 3,640,208
446 3,640,209

CLASS 100

53 3,640,210
258 3,640,211

CLASS 101

7 3,640,212
8 3,640,213
45 3,640,214
53 3,640,215
93C 3,640,216
3,640,217
375 3,640,218
401.1 3,640,219
426 3,640,220
453 3,640,221

CLASS 102

24 3,640,222
28 3,640,223
3,640,224
79 3,640,225

CLASS 104

96 3,640,226
130 3,640,227

CLASS 106

3 3,640,736
19 3,640,737
54 3,640,738
65 3,640,739
138 3,640,740
170 3,640,741
179 3,640,742
300 3,640,743
3,640,744
3,640,745

CLASS 108

6 3,640,228
58 3,640,229
63 3,640,230
106 3,640,231

CLASS 110

7R 3,640,232
8R 3,640,233

CLASS 111

6 3,640,234

CLASS 112

121.29 3,640,235
243 3,640,236

CLASS 114

16R 3,640,237
235A 3,640,238

CLASS 115

27 3,640,239
28 3,640,240

CLASS 116

109 3,640,241
173 3,640,242

CLASS 117

17.5 3,640,746
21 3,640,747
28 3,640,749
33.3 3,640,748
36.2 3,640,750
37LE 3,640,751
47 3,640,752
62.2 3,640,753
70B 3,640,754
71M 3,640,755
76A 3,640,756
93.1PF 3,640,757
96 3,640,758
97 3,640,759
99 3,640,760
100C 3,640,761
107.1 3,640,762
126GF 3,640,763
212 3,640,764
3,640,765
218 3,640,766
234 3,640,767

CLASS 118

24 3,640,243

212 3,640,244
259 3,640,245
629 3,640,246
637 3,640,247
3,640,248
3,640,249

CLASS 122

406ST 3,640,250
406S 3,640,251

CLASS 123

8.31 3,640,252
103B 3,640,253
119CF 3,640,254
119R 3,640,255
122AB 3,640,256
136 3,640,257
140FG 3,640,258
140MC 3,640,259
148E 3,640,260
188S 3,640,261

CLASS 124

7 3,640,262
11 3,640,263

CLASS 126

110R 3,640,264
113 3,640,265
3,640,266

CLASS 127

37 3,640,768

CLASS 128

2B 3,640,268
2R 3,640,269
2 3,640,267
2.05D 3,640,271
2.1E 3,640,270
33 3,640,272
87 3,640,273
173 3,640,274
214F 3,640,276
3,640,277
214 3,640,275
218D 3,640,278
305 3,640,279
317 3,640,280
347 3,640,281
351 3,640,282
399 3,640,283
422 3,640,284

CLASS 131

2 3,640,285
235 3,640,286
261B 3,640,287

CLASS 132

9 3,640,288
3,640,289
32C 3,640,290
84 3,640,291

CLASS 133

5 3,640,292

CLASS 134

9 3,640,293
42 3,640,769
117 3,640,294
159 3,640,295

CLASS 135

4R 3,640,296
25 3,640,297
3,640,298

CLASS 136

6 3,640,770
3,640,771
67 3,640,772
86 3,640,773
3,640,774
134 3,640,775

CLASS 137

1 3,640,299
81.5 3,640,300
101 3,640,301
142 3,640,302
238 3,640,303
315 3,640,304
360 3,640,305
512.1 3,640,306
557 3,640,307
561 3,640,308
614.04 3,640,309
625.46 3,640,310
637.4 3,640,311

CLASS 138

121 3,640,312

CLASS 139

12 3,640,313
3,640,314
107 3,640,315
127R 3,640,316

CLASS 140

82 3,640,317

CLASS 141

11 3,640,318
42 3,640,319
59 3,640,320

CLASS 142

55 3,640,321

CLASS 144

34E 3,640,322
193A 3,640,323

CLASS 145

29R 3,640,324

CLASS 146

241 3,640,325

CLASS 148

6 3,640,778
6.16 3,640,776
12.7 3,640,781
13 3,640,777
32.5 3,640,779
111 3,640,780
186 3,640,783
187 3,640,782

CLASS 149

43 3,640,784
88 3,640,785

CLASS 151

37 3,640,326
41.7 3,640,328
41.74 3,640,327

CLASS 152

205 3,640,329

CLASS 156

73 3,640,786
77 3,640,787
82 3,640,788
92 3,640,789
230 3,640,791
251 3,640,790
345 3,640,792
583 3,640,794

CLASS 159

6 3,640,330
23 3,640,331

CLASS 160

133 3,640,332
183 3,640,333

CLASS 161

3 3,640,795
43 3,640,796
60 3,640,797
68 3,640,793
3,640,798
92 3,640,831
159 3,640,829
160 3,640,832
165 3,640,830
3,640,833
3,640,834
3,640,835
3,640,836
3,640,837
190 3,640,838

CLASS 162

129 3,640,839
164 3,640,840
3,640,841
175 3,640,842
343 3,640,843

CLASS 164

269 3,640,334
339 3,640,335

CLASS 165

1 3,640,336
23 3,640,337
48 3,640,338
76 3,640,339
166 3,640,340

CLASS 166

72 3,640,342
115 3,640,341
292 3,640,343
307 3,640,344

CLASS 172

311 3,640,345
318 3,640,346
349 3,640,347
573 3,640,348

CLASS 173

32 3,640,349
61 3,640,350
105 3,640,351

CLASS 174

40R 3,641,251
52R 3,641,252
68.5 3,641,254
93 3,641,253

CLASS 175

107 3,640,352
202 3,640,353
243 3,640,354
329 3,640,355
3,640,356

CLASS 176

18 3,640,844
36 3,640,845

CLASS 178

5.4ST 3,641,255
3,641,256
6 3,641,263
6.5 3,641,264
6.6A 3,641,265
6.8 3,641,257
3,641,266
7.3R 3,641,258
3,641,267
3,641,268
7.5R 3,641,259
7.7 3,641,260
7.8 3,641,261
25 3,641,262
27 3,641,269

CLASS 179

2A 3,641,270
15AA 3,641,271
15AT 3,641,272
15BA 3,641,273
15BF 3,641,275
15BS 3,641,274
18BF 3,641,276
100.2MD 3,641,278
3,641,279
100.2C 3,641,281
100.2D 3,641,277
100.2E 3,641,280
100.2S 3,641,282
100.2Z 3,641,283
100.41K 3,641,284

CLASS 181

33G 3,640,357

CLASS 182

221 3,640,358

CLASS 191

40 3,641,285

CLASS 192

3R 3,640,359
4A 3,640,360
48.7 3,640,362
65 3,640,363
70.18 3,640,361
98 3,640,364
105BA 3,640,365

CLASS 193

7 3,640,366
31 3,640,367

CLASS 195

27 3,640,846
31R 3,640,847
51R 3,640,848

CLASS 196

124 3,640,849

CLASS 197

6.1 3,640,368
54 3,640,369
114 3,640,370

CLASS 198

16R 3,640,371
24 3,640,372
30 3,640,373
3,640,374
33AD 3,640,375
91 3,640,376
178 3,640,377
218 3,640,378

CLASS 200

5 3,641,286
16A 3,641,287
52 3,641,288
61.08 3,641,289
61.45 3,641,290
67G 3,641,291
76 3,641,292
144R 3,641,293
3,641,294
148A 3,641,295
153R 3,641,296
166A 3,641,297
166C 3,641,298
3,641,300
167R 3,641,299

CLASS 203

11 3,640,850
42 3,640,851
96 3,640,852

CLASS 204

15 3,640,853
28 3,640,854
38B 3,640,799
38S 3,640,815
67 3,640,800
68 3,640,801
72 3,640,802
73 3,640,803
95 3,640,804
130 3,640,805
143GE 3,640,806
3,640,807
158HE 3,640,808
180G 3,640,809
181 3,640,810
192 3,640,811
3,640,812
299 3,640,813
300 3,640,814

CLASS 206

1R 3,640,379
4 3,640,380
56AA 3,640,381

CLASS 208

10 3,640,816
59 3,640,817
65 3,640,818
111 3,640,819

CLASS 209

12 3,640,382
17 3,640,383
74M 3,640,384
166 3,640,385
254 3,640,519
337 3,640,386

CLASS 210

6 3,640,820
59 3,640,821
65 3,640,822
73 3,640,387
94 3,640,388
130 3,640,390
169 3,640,391
232 3,640,392
321 3,640,393
322 3,640,394
334 3,640,395
493 3,640,396

CLASS 211

1.5 3,640,397
41 3,640,398
148 3,640,389
175 3,640,399

CLASS 212

3 3,640,400
49 3,640,401

CLASS 213

62 3,640,402

CLASS 214

1BB 3,640,404
1A 3,640,403
1B 3,640,405
6F 3,640,407
6G 3,640,406
8.5A 3,640,408
17CB 3,640,409
38A 3,640,410
41 3,640,411
152 3,640,412
396 3,640,413
514 3,640,414
672 3,640,415

CLASS 215

41 3,640,418
43 3,640,416
83 3,640,417

CLASS 219

10.55 3,641,301
10.65 3,641,302
56 3,641,303
85 3,641,304
99 3,641,305
113 3,641,306
121P 3,641,308
121 3,641,307
123 3,641,309
127 3,641,310
135 3,641,311
532 3,641,312

CLASS 220

5A 3,640,419
9R 3,640,420
22.3 3,640,421
24.5 3,640,422
31R 3,640,423
46R 3,640,424
86R 3,640,425

CLASS 221

67 3,640,426
127 3,640,427
211 3,640,428

CLASS 222

1 3,640,429
3,640,430
48 3,640,431
82 3,640,432
129.2 3,640,433
144.5 3,640,434
335 3,640,435
402.24 3,640,436

CLASS 225

96.5 3,640,437

CLASS 226

25 3,640,438
32 3,640,439
34 3,640,440
49 3,640,441
158 3,640,442

CLASS 227

120 3,640,443

CLASS 228

4 3,640,444

CLASS 229

15 3,640,445
17R 3,640,446
3,640,447
40 3,640,448
44 3,640,449
53 3,640,450

CLASS 232

43.1 3,640,451

CLASS 233

1A 3,640,452

CLASS 235

61.11D 3,641,317
61.12C 3,641,318
61.12R 3,641,319
61.6R 3,641,313
61.7B 3,641,315
3,641,316
61.8A 3,641,314
78 3,640,453
92PC 3,641,320
92T 3,641,321
132 3,641,322
150.2 3,641,323
151 3,641,324
151.1 3,641,325
151.11 3,641,326
155 3,641,327
156 3,641,328
3,641,329
159 3,641,330
3,641,331

CLASS 236

34 3,640,454
49 3,640,455

CLASS 237

7 3,640,456
12.3B 3,640,457
50 3,640,458

CLASS 238

14 3,640,459
349 3,640,460

CLASS 239

7 3,640,461
11 3,640,462
17 3,640,463
69 3,640,464
94 3,640,466
224 3,640,467
265.29 3,640,468
265.35 3,640,469
333 3,640,470
337 3,640,471
552 3,640,472
583 3,640,465
658 3,640,473

CLASS 240

1 3,641,332
6.4W 3,641,333
6.45R 3,641,334
10P 3,641,335
10.6R 3,641,336
52.15 3,641,337

CLASS 241

46.02 3,640,474
55 3,640,475
74 3,640,476

CLASS 242

18R 3,640,477
3,640,478
55.19A 3,640,479
56 3,640,480
56.8 3,640,481
67.1 3,640,482
74.1 3,640,483

CLASS 244

3.21 3,640,484
12C 3,640,485
12R 3,640,486
15A 3,640,487
17.19 3,640,488
23C 3,640,489
116 3,640,490
117R 3,640,491
124 3,640,492

CLASS 246

1R 3,641,338

CLASS 248

27 3,640,493
42 3,640,494
99 3,640,495
188.9 3,640,496
225 3,640,497
230 3,640,498

CLASS 250

41.9G 3,641,339
3,641,340
49.5E 3,641,341
52 3,641,342
71R 3,641,343
71 3,641,344
83R 3,641,346
83.3HP 3,641,348
83.3H 3,641,345
3,641,347
3,641,349
3,641,350
203 3,641,351
207 3,641,352
213VT 3,641,353
216 3,641,354
229 3,641,355

CLASS 251

305 3,640,499
326 3,640,500
332 3,640,501

CLASS 252

8.1 3,640,823
8.3 3,640,824
8.5A 3,640,826
8.5C 3,640,825
8.55 3,640,827
17 3,640,828
32.7 3,640,855
33.2 3,640,856
49.8 3,640,858
3,640,958
49.9 3,640,857
54 3,640,859
56 3,640,860
59 3,640,870
61 3,640,862
62.1 3,640,861
3,640,863
62.3V 3,640,864
62.51 3,640,871
62.61 3,640,867
62.9 3,640,865
3,640,866
63 3,640,868
67 3,640,869
75 3,640,872
78 3,640,873
95 3,640,874
99 3,640,875
3,640,876
3,640,877
3,640,878
103 3,640,879
121 3,640,882
171 3,640,881
3,640,884
182 3,640,886
186 3,640,885
301.1R 3,640,888
301.1 3,640,887
301.2R 3,640,889
301.4F 3,640,890
3,640,891
301.4R 3,639,932
316 3,640,892
321 3,640,893
344 3,640,894
396 3,640,895
408 3,640,896
412 3,640,897
429 3,640,898
431R 3,640,899
437 3,640,900
3,640,901
439 3,640,902
451 3,640,903
455R 3,640,904
455Z 3,640,905
3,641,095
3,641,096
519 3,640,906
521 3,640,907
545 3,640,883
555 3,640,880

CLASS 254

45 3,640,502
84 3,640,503
134.3PA 3,640,504
150 3,640,505
187 3,640,506

CLASS 256

6 3,640,507

CLASS 259

72 3,640,508
104 3,640,509
108 3,640,510
148 3,640,511

CLASS 260

2BP 3,640,909

2EP 3,640,910
2A 3,640,908
2.3 3,640,912
2.5AK 3,640,920
2.5EP 3,640,917
2.5FP 3,640,914
2.5HA 3,640,919
2.5E 3,640,921
2.5F 3,640,911
2.5L 3,640,916
2.5P 3,640,918
2.5R 3,640,913
3,640,915
4R 3,640,922
13 3,640,923
3,640,924
17.4GC 3,640,925
18EP 3,640,926
23CP 3,640,927
23EM 3,640,931
23XA 3,640,928
3,640,930
23H 3,640,929
29.3 3,640,932
29.4U 3,640,934
29.6HN 3,640,936
29.6TA 3,640,935
29.6R 3,640,933
30.8DS 3,640,937
32.8N 3,640,938
33.6AQ 3,640,939
3,640,940
33.6A 3,640,941
375B 3,640,943
37N 3,640,942
40 3,640,944
41B 3,640,946
45.7R 3,640,945
45.75K 3,640,947
3,640,950
3,640,953
45.75R 3,640,948
3,640,949
45.8NZ 3,640,952
45.8 3,640,951
45.95 3,640,954
47CP 3,640,956
47CZ 3,640,955
47EC 3,639,928
47EN 3,640,957
5R 3,640,958
64 3,640,959
65 3,640,960
67R 3,640,961
3,640,963
75H 3,640,964
75M 3,640,962
77.5AN 3,640,967
77.5AP 3,640,965
77.5R 3,640,966
3,640,968
78TF 3,640,969
78R 3,640,970
78.3R 3,640,971
78.4N 3,640,972
78.5T 3,640,973
3,640,974
79.5B 3,640,976
79.5C 3,640,975
80.78 3,640,977
82.1 3,640,978
3,640,979
3,640,980
88.2C 3,640,981
88.2R 3,640,982
89.7 3,640,983
92.1 3,640,984
3,640,985
93.1 3,640,986
93.7 3,640,987
94.2M 3,640,988
94.7A 3,640,990
99.3 3,640,989
112.5 3,640,991
141 3,640,992
146R 3,640,993
191 3,640,994
207.1 3,640,995
3,640,996
209R 3,640,997
210R 3,640,998
239BC 3,640,999
239.1 3,641,000
3,641,001
239.3R 3,641,003
239.3 3,641,002
239.55C 3,641,006
239.55D 3,641,005
239.55 3,641,007
3,641,008
239.57 3,641,009
239.8 3,641,004
240D 3,641,010
240G 3,641,011
240.9 3,641,012
243A 3,641,018
243C 3,641,014
3,641,015
3,641,018
243D 3,641,017
247 3,641,022
248AS 3,641,019
248CS 3,641,020
3,641,023
248 3,641,024
249.5 3,641,025
250 3,641,026
256.4C 3,641,035
256.4F 3,641,027
3,641,028
268BC 3,641,029
268TR 3,641,030
3,641,031
268C 3,641,036
270 3,641,037
287R 3,641,032
289R 3,641,038
292 3,641,039
293.72 3,641,040
294.8F 3,641,033
296D 3,641,034
296R 3,641,042
296T 3,641,041
306.8R 3,641,043
307D 3,641,044
307G 3,641,045
308R 3,641,046
309 3,641,047
309.2 3,641,048
3,641,051
309.6 3,641,049
310C 3,641,050
310R 3,641,052
326.3 3,641,053
327P 3,641,054
332.3R 3,641,055
333 3,641,056
340.2 3,641,057
340.5 3,641,058
340.6 3,641,059
340.7 3,641,060
340.9 3,641,061
347.4 3,641,062
348A 3,641,064
348R 3,641,063
3,641,065
348.5L 3,641,067
348.5V 3,641,066
397.45 3,641,069
3,641,070
397.5 3,641,068
398 3,641,071
401 3,641,072
410 3,641,075
410.6 3,641,073
410.9 3,641,074
429R 3,641,076
3,641,077
429.5 3,641,079
429.7 3,641,078
429.9 3,641,080
3,641,081
431 3,641,082
438.5C 3,641,083
448AD 3,641,085
3,641,086
448A 3,641,084
448.2N 3,641,088
3,641,089
3,641,090
448.8R 3,641,087
3,641,091
453AR 3,641,093
453PC 3,641,092
453PH 3,641,094
456A 3,641,097
465 3,641,098
465.3 3,641,100
3,641,101
3,641,102
465.4 3,641,103
465.6 3,641,099
3,641,104
465.8A 3,641,105
465.8 3,641,106
465.9 3,641,107
468B 3,641,108
473G 3,641,109
3,641,110
475SC 3,641,115
475P 3,641,111
3,641,112
3,641,114
479R 3,641,116
482B 3,641,117
484R 3,641,118
3,641,119
486H 3,641,120
491 3,641,113
497A 3,641,121
497R 3,641,122
500.5H 3,641,123
501.17 3,641,124
501.18 3,641,125
502.4A 3,641,126
513 3,641,131
514B 3,641,128
3,641,129
515P 3,641,130
516 3,641,127
517 3,641,132
518R 3,641,133
520 3,641,134
524R 3,641,135
3,641,136
526N 3,641,137
530N 3,641,138
533R 3,641,139
543P 3,641,141
543R 3,641,140
544F 3,641,142
545R 3,641,143
546 3,641,144
558H 3,641,145
562C 3,641,146
562 3,641,147
563P 3,641,148
563R 3,641,149
566A 3,641,150
570D 3,641,151
570.7 3,641,152
570.8TC 3,641,153
571 3,641,154
583H 3,641,155
586 3,641,156
599 3,641,157
600 3,641,158
611F 3,641,160
611R 3,641,159
613D 3,641,161
614AA 3,641,162
615A 3,641,163
3,641,164
618R 3,641,165
621R 3,641,166
648F 3,641,167
650R 3,641,168
652.5R 3,641,169
658C 3,641,170
3,641,171
658R 3,641,172
665R 3,641,186
666PY 3,641,173
666A 3,641,174
666B 3,641,175
3,641,187
668B 3,641,176
668F 3,641,179
669 3,641,180
671C 3,641,177
671P 3,641,178
674 3,641,181
680R 3,641,182
683D 3,641,189
683 3,641,183
3,641,190
683.15D 3,641,188
3,641,191
683.2 3,641,184
683.76 3,641,185
823 3,641,192
830TW 3,641,193
835 3,641,194
837R 3,641,195
849 3,641,196
854 3,641,197
857R 3,641,198
859R 3,641,199
860 3,641,200
867 3,641,201
869 3,641,202
870 3,641,203
874 3,641,204
876B 3,641,205
876R 3,641,206
3,641,207
3,641,208
880 3,641,209
885 3,641,210
889 3,641,211
893 3,641,212
895 3,641,213
897A 3,641,215
897B 3,641,214
3,641,217
897 3,641,216
928 3,641,218
929 3,641,219
944 3,641,220
949 3,641,221
959 3,641,222
961 3,641,223
964 3,641,224
976 3,641,225
990 3,641,226

CLASS 261

34A 3,640,512
78 3,640,513
91 3,640,514
92 3,640,515
121M 3,640,516

CLASS 263

11 3,640,517
52 3,640,518

CLASS 264

.5 3,641,227
43 3,641,229
53 3,641,228
152 3,641,230
155 3,641,231
171 3,641,232
179 3,641,233
282 3,641,234

CLASS 269

.024 3,640,519
323 3,640,520

CLASS 270

61F 3,640,521
72 3,640,522

CLASS 271

28 3,640,523
36 3,640,524

CLASS 272

79R 3,640,525
80 3,640,526
81 3,640,527
3,640,528
83A 3,640,530
83R 3,640,529

CLASS 273

1R 3,640,531
1.5A 3,640,532
73C 3,640,533
80.7 3,640,534
126R 3,640,535
130AB 3,640,536
161 3,640,537
187R 3,639,923

CLASS 274

4G 3,640,538
42 3,640,539

CLASS 277

25 3,640,540
96 3,640,541
136 3,640,542
237 3,640,543

CLASS 280

36C 3,640,547
47.35 3,640,544
124 3,640,545
150AB 3,640,546
289 3,640,548
435 3,640,549
491B 3,640,550

CLASS 285

39 3,640,551
110 3,640,552
277 3,640,553
382.2 3,640,554

CLASS 287

103A 3,640,555
189.36A 3,640,557
189.36B 3,640,556

CLASS 292

264 3,640,558
288 3,640,559
341.16 3,640,560

CLASS 294

16 3,640,561
65 3,640,562
87.2 3,640,563
99R 3,640,564

CLASS 296

137B 3,640,565

CLASS 297

68 3,640,566
116 3,640,567
232 3,640,568
248 3,640,569
316 3,640,570
384 3,640,571
390 3,640,572
440 3,640,575
3,640,576

CLASS 298

15G 3,640,577
175 3,640,578

CLASS 299

4 3,640,579
31 3,640,573
3,640,580
32 3,640,574
3,640,581

CLASS 300

3 3,640,582

CLASS 301

9DN 3,640,583
63PW 3,640,584

CLASS 302

17 3,640,585

CLASS 303

21BE 3,640,589
21F 3,640,587
21P 3,640,588
21R 3,640,586

CLASS 307

64 3,641,356
94 3,641,357
136 3,641,358
3,641,359
202 3,641,361
215 3,641,362
221C 3,641,360
221 3,641,363
240 3,641,364
241 3,641,365
251 3,641,366
252J 3,641,367
254 3,641,368
260 3,641,369
269 3,641,370
293 3,641,371
310 3,641,372

CLASS 308

9 3,640,590
184 3,640,591
193 3,640,592
196 3,640,593
212 3,640,594

CLASS 310

6 3,641,373
68D 3,641,374
105 3,641,375
113 3,641,376
153 3,641,377
214 3,641,378
239 3,641,379

CLASS 312

198 3,640,595
223 3,640,596

CLASS 313

39 3,641,380
40 3,641,381
105 3,641,382
109.5 3,641,383
161 3,641,384
175 3,641,385
179 3,641,386
270 3,641,387

CLASS 315

3.5 3,641,388
39 3,641,389
169 3,641,390

CLASS 316

10 3,640,597
28 3,641,391

CLASS 317

13R 3,641,392
22 3,641,393
27R 3,641,394
43 3,641,407
117 3,641,395
134 3,641,396
141S 3,641,397
230 3,641,399
234G 3,641,398
234R 3,641,400
3,641,401
3,641,402
235R 3,641,403
3,641,404
3,641,405
237 3,641,406

CLASS 318

227 3,641,408
258 3,641,409
345 3,641,410
373 3,641,411
470 3,641,412
480 3,641,413
662 3,641,414
696 3,641,415

CLASS 320

61 3,641,416

CLASS 321

7 3,641,417
3,641,418
8C 3,641,419
9 3,641,420
12 3,641,421

CLASS 323

8 3,641,422
9 3,641,423
17 3,641,424

CLASS 324

5R 3,641,426
9 3,641,427
24 3,641,428
34PS 3,641,429
51 3,641,430
61R 3,641,431

CLASS 325

4 3,641,432
8 3,641,433
17 3,641,434
63 3,641,435
64 3,641,436
305 3,641,437
332 3,641,438
363 3,641,439
383 3,641,440
430 3,641,441

CLASS 328

14 3,641,442
109 3,641,443
127 3,641,444
140 3,641,445
228 3,641,446

CLASS 329

126 3,641,447

CLASS 330

18 3,641,448
29 3,641,449
30D 3,641,450
134 3,641,451
176 3,641,452

CLASS 331

94.5 3,641,453
3,641,454
3,641,455
3,641,456
3,641,457
3,641,458
3,641,459
110 3,641,460
116R 3,641,461
117R 3,641,462

CLASS 332

9 3,641,468
16T 3,641,463

CLASS 333

10 3,641,464
22R 3,641,465

CLASS 335

190 3,641,466

CLASS 336

5 3,641,467

CLASS 337

404 3,641,469

CLASS 338

99 3,641,470
128 3,641,471

CLASS 339

10 3,641,472
14R 3,641,473
17L 3,641,474
3,641,475
36 3,641,476
59R 3,641,477
63M 3,641,478
94R 3,641,479
116R 3,641,480
126R 3,641,481
196M 3,641,482
217S 3,641,483

CLASS 340

3E 3,641,485
3R 3,641,484
38L 3,641,569
41 3,641,486
46 3,641,487
52D 3,641,489
52P 3,641,488
55 3,641,490
61 3,641,491
65 3,641,492
81F 3,641,493
146.1 3,641,494
146.3R 3,641,495
148 3,641,496
149A 3,641,497
149 3,641,499
152R 3,641,500
164R 3,641,498
172.5 3,641,501
3,641,502
3,641,503
3,641,504
3,641,505
3,641,506
3,641,507
3,641,508
173CR 3,641,510
173LM 3,641,513
173SP 3,641,516
173R 3,641,509
3,641,511
3,641,512
3,641,514
3,641,515

173.1 3,641,517
174BA 3,641,521
174PW 3,641,520
174RC 3,641,519
174SR 3,641,523
174TF 3,641,518
174M 3,641,522
174.1A 3,641,526
3,641,534
174.1C 3,641,528
3,641,529
174.1E 3,641,527
174.1G 3,641,525
174.1H 3,641,524
183 3,641,530
184 3,641,531
195 3,641,535
198 3,641,532
3,641,533
203 3,641,536
205 3,641,537
208 3,641,538
213.1 3,641,539
224 3,641,425
3,641,540
237R 3,641,541
238 3,641,542
239R 3,641,543
244C 3,641,544
248A 3,641,546
248B 3,641,545
253A 3,641,548
253R 3,641,547
258B 3,641,549
261 3,641,550
267 3,641,551
274 3,641,552
286 3,641,553
324A 3,641,554
3,641,555
3,641,556
3,641,557
3,641,558
3,641,559
324R 3,641,561
343 3,641,560
347AD 3,641,562
3,641,563
3,641,564
347DA 3,641,566
347 3,641,565
365 3,641,567
3,641,568
409 3,641,570
420 3,641,571

CLASS 343

7.3 3,641,572
12R 3,641,573
17.7 3,641,574
225 3,641,575
743 3,641,576
754 3,641,577
773 3,641,578
792.5 3,641,579
895 3,641,580

CLASS 345

208 3,641,538

CLASS 346

1 3,641,581
21 3,641,582
29 3,641,583
74MC 3,641,586
3,641,587
74MP 3,641,585
74M 3,641,584
75 3,641,588

CLASS 350

3.5 3,640,598
3,640,599
34 3,640,600
117 3,640,601
120 3,640,602
124 3,640,603
162SF 3,640,604
184 3,640,605
226 3,640,606
3,640,607
307 3,640,608
3,640,609

CLASS 351

13 3,640,610

CLASS 352

92 3,640,611
124 3,640,612

CLASS 353

23 3,640,613
26 3,640,614

CLASS 355

8 3,640,615
3,640,616
10 3,640,617
35 3,640,618
36 3,640,619
38 3,640,620
45 3,640,621
65 3,640,622
67 3,640,623

CLASS 356

36 3,640,624
97 3,640,625
103 3,640,626
104 3,640,627
152 3,640,628

CLASS 401

132 3,640,629
188 3,640,630
206 3,640,631

CLASS 408

11 3,640,632
12 3,640,633
35 3,640,634
101 3,640,635
128 3,640,636
197 3,640,637

CLASS 415

172 3,640,638
219 3,640,639

CLASS 416

2 3,640,640
62 3,640,641
93 3,640,642
136 3,640,643
157 3,640,644

CLASS 417

174 3,640,645
203 3,640,646
389 3,640,647

CLASS 418

133 3,640,648
191 3,640,649
206 3,640,650
269 3,640,651

CLASS 424

8 3,641,235
16 3,641,237
19 3,641,236
49 3,641,238
64 3,641,239
78 3,641,240
120 3,641,241
153 3,641,242
181 3,641,244
188 3,641,245
195 3,641,243
204 3,641,246
211 3,641,247
212 3,641,248
243 3,641,013

CLASS 425

20 3,640,652
33 3,640,653
78 3,640,654
83 3,640,793
109 3,640,655
113 3,640,656
114 3,640,657
117 3,640,658
133 3,640,659
141 3,640,660
159 3,640,661
174 3,640,662
233 3,640,663
275 3,640,664
297 3,640,665
302 3,640,666
326 3,640,667
346 3,640,668
376 3,640,669
382 3,640,670
387 3,640,671
3,640,672

CLASS 431

168 3,640,673

CLASSIFICATION OF DESIGNS

D 2—239 222,930
D 9— 83 222,931
D13— 6 222,932
D14— 3 222,933
D22— 1 222,934
222,935
222,936
222,937
222,938
D23— 5 222,939
98 222,940
D26— 1 222,941
13 222,942
222,943
222,944
D34— 5 222,945
15 222,946
222,947
222,948
D35— 3 222,949
D44— 29 222,950
D49— 34 222,951
D54— 12 222,952
222,953
D56— 1 222,954
D61— 222,955
D83— 222,956
222,957
D92— 4 222,958

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,640,132	3,640,285	3,640,698	3,641,349	3,640,044	3,641,219
3,640,534	3,640,306	3,640,708	3,641,358	3,640,081	3,641,234
3,641,025	3,640,319	3,640,712	3,641,362	3,640,102	12 : 3,640,279
4 : 3,640,137	3,640,327	3,640,714	3,641,365	3,640,232	3,640,294
3,640,197	3,640,329	3,640,783	3,641,366	3,640,245	3,640,427
3,640,426	3,640,337	3,640,785	3,641,368	3,640,269	3,640,778
3,640,703	3,640,346	3,640,813	3,641,370	3,640,286	3,641,260
3,640,927	3,640,365	3,640,821	3,641,371	3,640,307	3,641,288
3,641,450	3,640,366	3,640,845	3,641,389	3,640,392	3,641,302
5 : 3,640,641	3,640,374	3,640,850	3,641,396	3,640,523	3,641,367
3,640,687	3,640,375	3,640,855	3,641,422	3,640,592	3,641,427
3,641,253	3,640,378	3,640,856	3,641,424	3,640,593	3,641,434
6 : 3,639,917	3,640,390	3,640,876	3,641,438	3,640,666	3,641,473
3,639,919	3,640,400	3,640,879	3,641,442	3,640,671	3,641,485
3,639,924	3,640,404	3,640,885	3,641,446	3,640,693	3,641,487
3,639,938	3,640,406	3,640,894	3,641,454	3,640,721	3,641,531
3,639,948	3,640,419	3,640,904	3,641,455	3,640,779	3,641,574
3,639,950	3,640,422	3,640,959	3,641,456	3,640,843	13 : 3,639,957
3,639,952	3,640,435	3,640,961	3,641,468	3,640,936	3,640,025
3,639,961	3,640,472	3,640,963	3,641,470	3,640,968	3,640,235
3,639,971	3,640,481	3,641,037	3,641,472	3,641,080	3,640,322
3,639,974	3,640,484	3,641,055	3,641,476	3,641,081	3,640,405
3,639,990	3,640,492	3,641,071	3,641,480	3,641,197	3,640,448
3,640,001	3,640,500	3,641,074	3,641,492	3,641,286	3,640,563
3,640,004	3,640,504	3,641,076	3,641,498	3,641,291	3,641,073
3,640,013	3,640,512	3,641,096	3,641,504	3,641,344	3,641,155
3,640,019	3,640,513	3,641,104	3,641,512	3,641,348	15 : 3,640,008
3,640,037	3,640,525	3,641,131	3,641,519	3,641,355	16 : 3,640,432
3,640,041	3,640,527	3,641,137	3,641,524	3,641,387	17 : 3,639,914
3,640,047	3,640,528	3,641,161	3,641,525	3,641,453	3,639,936
3,640,070	3,640,537	3,641,170	3,641,527	3,641,457	3,639,941
3,640,082	3,640,544	3,641,171	3,641,528	3,641,486	3,639,942
3,640,091	3,640,549	3,641,226	3,641,553	3,641,536	3,639,962
3,640,136	3,640,555	3,641,230	3,641,573	10 : 3,640,447	3,639,963
3,640,139	3,640,558	3,641,255	3,641,579	3,640,585	3,639,972
3,640,141	3,640,559	3,641,257	3,641,580	3,640,672	3,639,984
3,640,154	3,640,565	3,641,261	3,641,582	3,640,755	3,639,985
3,640,174	3,640,569	3,641,264	3,641,584	3,640,788	3,639,997
3,640,190	3,640,570	3,641,265	8 : 3,639,949	3,640,897	3,640,016
3,640,208	3,640,571	3,641,266	3,640,129	3,640,898	3,640,035
3,640,220	3,640,573	3,641,279	3,640,199	3,640,908	3,640,036
3,640,242	3,640,578	3,641,280	3,640,351	3,640,920	3,640,051
3,640,246	3,640,579	3,641,306	3,640,456	3,640,946	3,640,054
3,640,252	3,640,597	3,641,307	3,640,465	3,640,974	3,640,055
3,640,256	3,640,605	3,641,323	3,640,502	3,641,005	3,640,068
3,640,257	3,640,624	3,641,328	3,640,678	3,641,006	3,640,118
3,640,263	3,640,627	3,641,334	3,641,024	3,641,048	3,640,146
3,640,272	3,640,628	3,641,335	3,641,277	3,641,067	3,640,229
3,640,277	3,640,636	3,641,337	3,641,526	3,641,092	3,640,282
3,640,281	3,640,686	3,641,338	3,641,534	3,641,142	3,640,283
3,640,284	3,640,689	3,641,341	9 : 3,639,996	3,641,217	3,640,323

3,640,324
3,640,340
3,640,348
3,640,370
3,640,380
3,640,389
3,640,391
3,640,402
3,640,454
3,640,480
3,640,483
3,640,498
3,640,508
3,640,524
3,640,584
3,640,612
3,640,617
3,640,623
3,640,629
3,640,699
3,640,734
3,640,735
3,640,741
3,640,766
3,640,791
3,640,817
3,640,819
3,640,820
3,640,826
3,640,842
3,640,847
3,640,860
3,640,903
3,640,933
3,640,973
3,641,068
3,641,143
3,641,159
3,641,165
3,641,169
3,641,188
3,641,220
3,641,262
3,641,287
3,641,298
3,641,310
3,641,313
3,641,319
3,641,333
3,641,369
3,641,395
3,641,407
3,641,408
3,641,416
3,641,435
3,641,441
3,641,451
3,641,481
3,641,529
3,641,530
3,641,576
3,641,583
3,641,588
18 : 3,639,945
3,639,982
3,639,986
3,640,039
3,640,087
3,640,128
3,640,142
3,640,157
3,640,234
3,640,239
3,640,255
3,640,305
3,640,412
3,640,423
3,640,469
3,640,560
3,640,679
3,640,697
3,640,814
3,641,014
3,641,018
3,641,019
3,641,021
3,641,041
3,641,058
3,641,122
3,641,126
3,641,207
3,641,241
3,641,256
3,641,263
3,641,320
3,641,381
3,641,474
3,641,488
3,641,538
3,641,538
19 : 3,639,926
3,640,345
3,640,403
3,641,231
3,641,572
20 : 3,640,816
3,641,296
21 : 3,639,920
3,640,007
3,640,088
3,640,089
3,640,372
3,640,580
3,641,380
22 : 3,639,946
3,640,031
3,640,075
3,640,577
3,640,682
3,640,818
3,641,084
3,641,177
3,641,186
3,641,211
3,641,216
3,641,314
23 : 3,640,266
24 : 3,640,168
3,640,178
3,640,207
3,640,243
3,640,268
3,640,519
3,640,541
3,640,588
3,640,739
3,640,763
3,640,923
3,640,925
3,641,193
3,641,350
3,641,353
3,641,372
3,641,379
3,641,423
3,641,445
3,641,511
3,641,558
3,641,559
25 : 3,639,937
3,639,959
3,639,965
3,639,968
3,640,028
3,640,029
3,640,065
3,640,101
3,640,108
3,640,138
3,640,161
3,640,169
3,640,194
3,640,196
3,640,200
3,640,221
3,640,251
3,640,267
3,640,377
3,640,386
3,640,388
3,640,393
3,640,433
3,640,482
3,640,539
3,640,556
3,640,599
3,640,613
3,640,631
3,640,668
3,640,668
3,640,711
3,640,713
3,640,717
3,640,724
3,640,757
3,640,760
3,640,770
3,640,771
3,640,773
3,640,774
3,640,854
3,640,932
3,641,034
3,641,103
3,641,331
3,641,359
3,641,386
3,641,399
3,641,420
3,641,429
3,641,460
3,641,484
3,641,503
3,641,518
3,641,523
3,641,543
3,641,546
3,641,547
3,641,554
3,641,563
3,641,564
3,641,565
3,641,569
26 : 3,639,967
3,639,998
3,640,153
3,640,173
3,640,182
3,640,184
3,640,226
3,640,227
3,640,296
3,640,301
3,640,325
3,640,347
3,640,408
3,640,410
3,640,421
3,640,425
3,640,442
3,640,446
3,640,515
3,640,546
3,640,553
3,640,554
3,640,594
3,640,608
3,640,609
3,640,633
3,640,642
3,640,654
3,640,667
3,640,684
3,640,789
3,640,815
3,640,829
3,640,857
3,640,873
3,640,886
3,640,909
3,640,913
3,640,922
3,640,940
3,640,949
3,640,957
3,640,997
3,641,004
3,641,010
3,641,020
3,641,151
3,641,160
3,641,180
3,641,208
3,641,210
3,641,212
3,641,239
3,641,244
3,641,326
3,641,419
3,641,544
27 : 3,639,940
3,640,034
3,640,225
3,640,230
3,640,231
3,640,321
3,640,409
3,640,494
3,640,606
3,640,607
3,640,676
3,640,718
3,640,732
3,640,764
3,640,944
3,641,144
3,641,145
3,641,240
3,641,299
3,641,384
28 : 3,640,461
3,640,981
29 : 3,639,989
3,640,354
3,640,429
3,640,434
3,640,485
3,640,530
3,640,784
3,641,109
3,641,222
3,641,235
3,641,245
31 : 3,640,074
3,640,430
3,640,535
32 : 3,639,925
3,640,382
3,641,509
33 : 3,641,308
3,641,324
3,641,382
3,641,549
34 : 3,640,005
3,640,014
3,640,027
3,640,048
3,640,084
3,640,106
3,640,113
3,640,145
3,640,150
3,640,171
3,640,189
3,640,218
3,640,250
3,640,274
3,640,288
3,640,293
3,640,310
3,640,312
3,640,318
3,640,407
3,640,455
3,640,519
3,640,626
3,640,635
3,640,661
3,640,680
3,640,692
3,640,725
3,640,728
3,640,729
3,640,759
3,640,765
3,640,800
3,640,811
3,640,812
3,640,827
3,640,838
3,640,853
3,640,864
3,640,869
3,640,870
3,640,874
3,640,878
3,640,892
3,640,895
3,640,905
3,640,924
3,640,926
3,640,947
3,640,950
3,640,958
3,640,965
3,640,978
3,640,979
3,640,980
3,640,984
3,641,017
3,641,029
3,641,032
3,641,040
3,641,047
3,641,061
3,641,063
3,641,065
3,641,083
3,641,110
3,641,120
3,641,133
3,641,134
3,641,147
3,641,152
3,641,156
3,641,157
3,641,158
3,641,179
3,641,181
3,641,183
3,641,185
3,641,190
3,641,192
3,641,200
3,641,204
3,641,213
3,641,237
3,641,238
3,641,243
3,641,258
3,641,304
3,641,305
3,641,332
3,641,361
3,641,388
3,641,398
3,641,432
3,641,437
3,641,448
3,641,459
3,641,463
3,641,475
3,641,505
3,641,533
3,641,541
3,641,578
35 : 3,639,983
3,640,295
3,640,385
3,641,444
3,641,479
36 : 3,639,916
3,639,923
3,639,975
3,639,976
3,639,988
3,639,992
3,639,994
3,639,995
3,639,999
3,640,010
3,640,018
3,640,030
3,640,042
3,640,124
3,640,148
3,640,149
3,640,166
3,640,176
3,640,198
3,640,204
3,640,212
3,640,213
3,640,217
3,640,219
3,640,222
3,640,248
3,640,249
3,640,265
3,640,278
3,640,289
3,640,300
3,640,302
3,640,317
3,640,328
3,640,369
3,640,379
3,640,384
3,640,428
3,640,438
3,640,439
3,640,459
3,640,493
3,640,516
3,640,529
3,640,531
3,640,547
3,640,572
3,640,576
3,640,583
3,640,602
3,640,614
3,640,615
3,640,616
3,640,620
3,640,630
3,640,655
3,640,655
3,640,656
3,640,657
3,640,659
3,640,681
3,640,688
3,640,707
3,640,710
3,640,720
3,640,722
3,640,731
3,640,733
3,640,738
3,640,746
3,640,748
3,640,775
3,640,781
3,640,782
3,640,788
3,640,825
3,640,841
3,640,849
3,640,858
3,640,861
3,640,865
3,640,872
3,640,875
3,640,884
3,640,887
3,640,896
3,640,943
3,640,953
3,640,954
3,640,956
3,640,958
3,640,977
3,640,991
3,641,012
3,641,015
3,641,022
3,641,046
3,641,050
3,641,054
3,641,090
3,641,108
3,641,202
3,641,225
3,641,229
3,641,259
3,641,282
3,641,297
3,641,340
3,641,342
3,641,352
3,641,360
3,641,364
3,641,392
3,641,393
3,641,400
3,641,402
3,641,405
3,641,428
3,641,431
3,641,433
3,641,439
3,641,440
3,641,478
3,641,496
3,641,500
3,641,506
3,641,510
3,641,515
3,641,516
3,641,556
3,641,567
3,641,575
37 : 3,639,987
3,639,991
3,640,057
3,640,064
3,640,090
3,640,287
3,640,550
3,640,652
3,640,670
3,640,670
3,640,823
3,640,881
3,641,458
3,641,537
38 : 3,640,520
39 : 3,639,921
3,639,930
3,639,978
3,640,049
3,640,073
3,640,086
3,640,093
3,640,112
3,640,131
3,640,155
3,640,162
3,640,163
3,640,170
3,640,195
3,640,254
3,640,326
3,640,338
3,640,383
3,640,394
3,640,398
3,640,413
3,640,418
3,640,453
3,640,538
3,640,543
3,640,564
3,640,586
3,640,591
3,640,596
3,640,610
3,640,611
3,640,632
3,640,651
3,640,653
3,640,662
3,640,690
3,640,704
3,640,726
3,640,727
3,640,737
3,640,745
3,640,758
3,640,762
3,640,769
3,640,776
3,640,793
3,640,890
3,640,891
3,640,906
3,640,938
3,640,941
3,640,975
3,640,976
3,640,985
3,640,989
3,641,011
3,641,045
3,641,095
3,641,218
3,641,246
3,641,247
3,641,303
3,641,514
3,641,535
3,641,552
40 : 3,639,970
3,640,237
3,640,280

3,640,344
3,640,665
3,640,801
3,640,802
3,640,824
3,640,882
3,640,901
3,640,986
3,640,988
3,640,990
3,641,075
3,641,085
3,641,099
3,641,130
3,641,163
3,641,172
3,641,182
3,641,184
3,641,290
41 : 3,640,003
3,640,304
3,640,387
3,640,449
3,640,805
3,641,354
3,641,555
42 : 3,639,922
3,639,932
3,639,934
3,639,966
3,639,977
3,639,980
3,640,040
3,640,114
3,640,119
3,640,122
3,640,133
3,640,158
3,640,180
3,640,185
3,640,191
3,640,203
3,640,233
3,640,275
3,640,309
3,640,334
3,640,415
3,640,416
3,640,444
3,640,451
3,640,473
3,640,487
3,640,491
3,640,521
3,640,552
3,640,557
3,640,562
3,640,646
3,640,747
3,640,780
3,640,792
3,640,810
3,640,844
3,640,846
3,640,852
3,640,859
3,640,862
3,640,868
3,640,900
3,640,934
3,640,935
3,640,960
3,640,964
3,640,998
3,641,000
3,641,027
3,641,028
3,641,030
3,641,086
3,641,111
3,641,114
3,641,121
3,641,128
3,641,129
3,641,132
3,641,135
3,641,136
3,641,138
3,641,139
3,641,148
3,641,149
3,641,168
3,641,174
3,641,191
3,641,199
3,641,201
3,641,228
3,641,242
3,641,251
3,641,254
3,641,268
3,641,376
3,641,410
3,641,411
3,641,413
3,641,417
3,641,421
3,641,425
3,641,461
3,641,532
3,641,539
3,641,540
3,641,551
3,641,570
3,641,571
44 : 3,640,160
3,640,164
3,640,396
3,641,449
45 : 3,640,062
3,640,192
3,640,315
3,640,675
46 : 3,640,395
47 : 3,640,000
3,640,058
3,640,468
3,640,742
3,640,808
3,640,888
3,640,995
3,641,312
3,641,401
48 : 3,639,928
3,639,944
3,640,006
3,640,080
3,640,140
3,640,159
3,640,181
3,640,183
3,640,264
3,640,271
3,640,273
3,640,290
3,640,299
3,640,332
3,640,341
3,640,342
3,640,343
3,640,352
3,640,355
3,640,399
3,640,411
3,640,420
3,640,445
3,640,462
3,640,501
3,640,514
3,640,548
3,640,601
3,640,658
3,640,658
3,640,736
3,640,831
3,640,899
3,640,939
3,641,033
3,641,107
3,641,430
3,641,443
3,641,491
3,641,542
3,641,548
49 : 3,640,336
3,641,465
50 : 3,639,947
3,640,099
3,640,431
51 : 3,640,209
3,640,224
3,640,308
3,640,532
3,640,743
3,641,052
3,641,276
3,641,327
3,641,418
3,641,452
3,641,566
52 : 3,640,045
53 : 3,639,931
3,640,083
3,640,115
3,640,121
3,640,359
3,640,414
3,640,511
3,640,598
3,640,603
3,640,645
3,640,740
3,641,391
3,641,414
3,641,499
54 : 3,640,533
3,640,744
3,640,911
3,640,951
3,641,115
55 : 3,639,915
3,639,933
3,639,956
3,639,973
3,640,050
3,640,085
3,640,104
3,640,276
3,640,358
3,640,360
3,640,363
3,640,595
3,640,767
3,640,889
3,640,916
3,641,293
3,641,294
3,641,300
3,641,375
3,641,397
3,641,467

DESIGN PATENTS

6 : 222,956
222,957
12 : 222,949
222,955
17 : 222,950
25 : 222,931
26 : 222,930
27 : 222,941
29 : 222,951
34 : 222,939
222,958
36 : 222,953
39 : 222,945
222,946
222,947
222,948
42 : 222,954
47 : 222,940
51 : 222,942
222,943
222,944
53 : 222,933

U.S. GOVERNMENT PRINTING OFFICE : 0—1972

U. S. DEPARTMENT OF COMMERCE
Maurice H. Stans, *Secretary*

PATENT OFFICE
Robert Gottschalk, *Commissioner*